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DELAWARE RIVER BASIN - ZONE 3 (EXCLUSIVE OF THE SCHUYLKILL RIVER BASIN)

Public Health Service
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REPORT ON WATER POLLUTION CONTROL

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

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Prepared by

FEDERAL SECURITY AGENCY

Public Health Service
Division of Water Pollution Control
North Atlantic Drainage Basins Office

May 1952

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INTRODUCTION

The Federal Water Pollution Control Act, Public Law 845, passed by the 80th Congress in June of 1948, provided for full recognition of the primary responsibilities and rights of the States in controlling water pollution. It requires the Surgeon General of the Public Health Service to cooperate with other Federal agencies, with State and interstate water pollution control agencies, and with municipalities and industries in the preparation or adoption of comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries thereof, and improving the sanitary condition of surface and underground waters.

In developing these programs, due regard must be given to improvements necessary to conserve the Nation's waters for public water supplies, propagation of fish and aquatic life, recreational purposes, agricultural, industrial, and other legitimate uses.

As a first step in carrying out this requirement, the data available as of July 1, 1950, were presented in summary type reports covering the major drainage basins in the United States, the data concerning the Delaware River Basin being presented briefly in the summary report on the North Atlantic Drainage Basins.

The summary report considered the water pollution problems of the Delaware River Basin as a whole. This report contains pollution data available as of May, 1952 and relates to water pollution control measures in Zone 3 of the Delaware River Basin, exclusive of the Schuylkill River Basin.

Water pollution control in this region has been given considerable study by the health agencies of the four States of New York, New Jersey, Pennsylvania and Delaware charged with this administrative responsibility, and the Interstate Commission on the Delaware River Basin (Incodel), a joint cooperative agency maintained by the four states.

Pollution control activities of these agencies of the States are supported by their respective State laws relating to intrastate water pollution and the Incodel laws which have been passed by each of the States in the form of reciprocal legislation for the control of the interstate Delaware River and its tributaries.

The Incodel laws enacted, New Jersey - Chapter 146, July 1, 1939; New York - Chapter 600, May 31, 1939; Delaware - Chapter 93, May 8, 1941; and Pennsylvania - Chapter 123, April 19, 1945; provide for the minimum degree of treatment of wastes discharged in each of four zones of the Delaware River Basin.

ZONE 1: Zone 1 is that part of the Delaware River and its West Branch extending from the New York-Pennsylvania boundary line to the head of tidewater at Trenton, New Jersey and Morrisville, Pennsylvania.

The drainage basin contributory to this zone, excepting part of the Lehigh River Basin, is relatively sparsely inhabited and contains few sewered communities and relatively few industrial establishments producing waste water. The streams draining this area being, in general, relatively clean and of high elevation, are well adapted as sources of public water supplies, after treatment or purification.

The principal uses of the waters of the Delaware River in Zone 1 are expected to be for water supply after such treatment or purification as may be necessary, and for recreation, bathing, maintenance of fish and aquatic life, agriculture, and for other related purposes.

ZONE 2: Zone 2 is that part of the Delaware River extending from the head of tidewater at Trenton, New Jersey and Morrisville, Pennsylvania, to a line drawn perpendicular to the channel of the Delaware River from the mouth of Pennypack Creek in Philadelphia, Pennsylvania, to the corresponding point on the New Jersey shore.

The drainage basin contributory to this zone is somewhat more densely populated than that of Zone 1, and it contains more sewered communities and industrial establishments.

The principal uses of the waters of the Delaware River in Zone 2 are expected to be for water supply, after treatment or purification, and for recreation, navigation, maintenance of fish and aquatic life, agricultural, industrial and other purposes.

ZONE 3: Zone 3 is that part of the Delaware River extending from the aforesaid line connecting the mouth of Pennypack Creek in Philadelphia and the corresponding point in New Jersey to the Pennsylvania-Delaware boundary line.

The drainage basin contributory to this zone contains populous metropolitan areas including Philadelphia, Pennsylvania and Camden, New Jersey.

The principal uses of the waters of the Delaware River in Zone 3 are expected to be for navigation, industrial water supply, and other purposes.

The water in this zone, however, should be of such sanitary quality that it will not be unfit for use as sources of water supply, will not be harmful to fish life, and will not adversely affect the quality of the waters of the tidal tributaries.

ZONE 4: Zone 4 is that part of the Delaware River extending from the Pennsylvania-Delaware boundary line to the Atlantic Ocean.

The principal uses of the waters of the Delaware River in Zone 4 are expected to be for navigation, industrial water supplies, commercial fishing, shellfish culture, recreation and other purposes.

This report describes the status as of May, 1952 of the

comprehensive water pollution control programs conducted by the New Jersey State Department of Health, the Sanitary Water Board of the Pennsylvania Department of Health and the Interstate Commission on the Delaware River Basin in that portion of the drainage area contributory to Zone 3 of the Delaware River Basin, exclusive of the Schuylkill River Basin. It sets forth information about the ways the water resources of the area are used, the pollution entering those water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures in effect, and those which appear to be needed. Its scope is limited to surface water pollution control. Ground water pollution has not been considered in the report although usage of ground water is mentioned. While it is true that additional information is needed to complete the program, the objectives have been established and general plans for attaining them have been adopted by the States and Incodel. The program is well advanced with the major portion aimed toward completion by 1955.

The data on which this report is based have been compiled through and in cooperation with the New Jersey State Department of Health, the Sanitary Water Board of the Pennsylvania Department of Health, and the Interstate Commission on the Delaware River Basin, (Incodel). Through these agencies additional data have been obtained from other State officials, municipal officials, and representatives of industry. Federal agencies also have cooperated.

The detailed data and remarks relating to individual sources of pollution appearing in Basic Data Tables 1 and 2, are the determination of the State water pollution control agencies and are included to illustrate the status of the program, as of May, 1952.

Comprehensive programs for pollution control must necessarily be fluid. They must allow for growth, development and changing conditions. The program now in effect in this area appears to fit the current needs. Reappraisal in the course of time will provide for adjustments as the need arises.

A sincere effort has been made by all who contributed to this report to present a fair picture of the complex water pollution problems in the Delaware River Basin - Zone 3, exclusive of the Schuylkill River Basin, and to present reasonable conclusions and recommendations. It is our hope that this report will help in safeguarding the water resources in this area.

ACKNOWLEDGMENTS

The Public Health Service wishes to acknowledge the cooperation and assistance of those agencies and individuals that have contributed to the preparation of this report.

The New Jersey State Department of Health and the Sanitary Water Board in the Pennsylvania Department of Health, the water pollution control agencies of the respective States, have furnished the data from which the various tables were prepared and other data and information contained in the narrative statements. The Interstate Commission on the Delaware River Basin also supplied considerable data and assisted in drafting portions of the report. These agencies have, in addition, reviewed the preliminary draft of the report and offered valuable comments and suggested changes. The preliminary report has also been reviewed by the Delaware Water Pollution Commission and the New York State Department of Health. In general, the preliminary draft has been revised so that this report is in agreement with the comments and suggestions of the participating State and interstate agencies.

Federal agencies from which assistance was obtained include the Corps of Engineers, Department of the Army; the Geological Survey, the Fish and Wildlife Service, and the National Park Service, Department of the Interior; the Bureau of the Census and the Weather Bureau, Department of Commerce; and the Soil Conservation Service, Department of Agriculture.

Finally, there is acknowledged the assistance of other State and Federal agencies and individuals interested in water resources development and conservation that have contributed information through other sources than those listed above.

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SUMMARY

Zone 3 of the Delaware River is that part of the Delaware River about 30 miles in length extending from a line connecting the mouth of Pennypack Creek in Philadelphia and a corresponding point on the New Jersey shore to the Pennsylvania-Delaware boundary line. The drainage area contributory to Zone 3 is approximately 2650 square miles of which 1910 square miles are drained by the Schuylkill River in Pennsylvania. This report covers an area of about 740 square miles contributory to Zone 3 in the southeastern section of Pennsylvania and the southwestern portion of New Jersey and includes that portion of Philadelphia on the Schuylkill River watershed which will be served by a sewage treatment plant with discharge into the Delaware River. This region which is about 6% of the drainage area of the entire Delaware River Basin includes the northeastern part of Philadelphia to Pennypack Creek, the lower portion of Montgomery County, a part of Chester County and the major portion of Delaware County in Pennsylvania to the Pennsylvania-Delaware State line. In New Jersey, Zone 3 extends from the upper limits of Riverton, in Burlington County, to Mortonville, near the southern boundary of Gloucester County.

The estimated 1950 population of the area is 2,860,000 an increase of about 20% over the 1940 census. About 86% reside in Pennsylvania and 14% in New Jersey with the greater portion concentrated in the Philadelphia-Camden metropolitan region. There are 127 political subdivisions in the area. These comprise 5 cities, 65 boroughs, 50 townships and seven counties. The largest cities, Philadelphia and Camden, are the center of this highly industrialized region which contains shipbuilding yards, oil refineries, chemical plants, food processing and packing plants, textile, dye, paper, steel and other industries. This zone is also the center of the Delaware River Port, the second largest port in the country.

Water for domestic and industrial requirements is taken from both surface and underground sources. The public water supply systems serve about 421,000,000 gallons per day of which approximately 90% is obtained from surface streams. Philadelphia takes approximately one-half of its supply from the Delaware River and is the only municipality in the zone taking water for public supply from the Delaware River. The City of Chester in November, 1951 abandoned the river as a source of supply when the new 15 million dollar Octarora Creek system was placed in operation. Other municipalities on the Pennsylvania side of the river obtain their water supplies from tributaries at points above the tidal influence of the Delaware River. In New Jersey, in Zone 3, all of the municipal water supplies amounting to about 41,000,000 gallons per day are obtained from underground sources. Almost the entire population is within reach of a public water supply.

Industrial establishments in the area use about 2 1/2 billion gallons of water per day. Of this amount 38 m.g.d. are furnished from the public water supply systems, 24 m.g.d. are obtained from private industrial wells and the remainder from streams.

It has been estimated that in Zone 3 ground water is used to the extent of about 125 million gallons per day by the municipalities and industries in New Jersey and the industries in southeastern Philadelphia.

The streams of Zone 3 received the waste waters discharged from 70 municipal sewer systems which serve a population of approximately 2,587,000 or about 91% of the estimated population in the area. Fifty-nine of the systems in 51 municipalities have sewage treatment plants which serve a population of about 906,000. Eleven systems in eight municipalities serve about 1,681,000 persons and discharge untreated wastes the major portion of which is from those sections of Philadelphia and Camden for which treatment plants are now being constructed.

Wastes from 60 sources of pollution contributed by 58 industrial establishments are discharged directly to the streams. Fifty of the sources contribute organic wastes, five inorganic wastes, and five contribute both organic and inorganic wastes. Data available for 18 sources including two separate sewage treatment plants at industrial establishments indicate the discharge of a pollution load having a population equivalent of approximately 394,000. Twenty-seven sources are provided with treatment works.

The Zone 3 section of the Delaware River receives more wastes from this densely populated and highly industrialized section than is received by any of the other zones in the Delaware River Basin. The discharge of untreated and inadequately treated municipal sewage and industrial wastes presents a potential danger to public health. The City of Philadelphia which obtains about one-half of its public water supply from the Delaware River is required to use practically every known means of water treatment, especially those for the control of tastes and odors, in its public water supply. Industries which find it necessary to use the river supply for industrial purposes are subject to considerable expense for water treatment and maintenance of equipment. Real estate values have depreciated because of stream pollution and increased costs have been placed on commerce and navigation. Discharges of domestic and industrial wastes, together with occasional slugs of oil from bilges and other sources have destroyed recreational facilities in this region and created conditions which will not support fish and aquatic life during periods of low flow in this section of the river.

The 59 sewage treatment plants serving about 906,000 persons or 32% of the entire population in the region and 35% of those served with sewers, consist of 13 primary treatment plants which serve about 144,000 persons and 46 secondary treatment plants which serve a population of approximately 762,000. Eight of the existing primary treatment plants and 10 secondary treatment plants are inadequate to provide the degree of treatment required and are in need of improvements. One satisfactory secondary treatment plant is being enlarged to provide for future development. The treatment needs of one primary treatment plant and one secondary plant have not been determined.

Of the 27 industrial waste treatment works, including two

separate sewage treatment plants at industrial establishments, 11 are considered to be of adequate capacity, 5 unsatisfactory and 11 classified as undetermined.

Of the 30 municipal sources of pollution needing new or additional sewage treatment facilities, five municipalities have seven projects under construction which will serve ten existing sources and about 1,596,000 persons or approximately 85% of the population in need of treatment facilities. Fourteen municipalities have plans which have been approved or are in preparation to treat the wastes from 16 sources, and four have not reached the planning stage.

There are 32 industries needing projects for abatement of stream pollution. Four have works under construction, 26 have plans approved or under preparation, and two are inactive or of undetermined status.

A list of the municipalities and industries needing improvements as of May, 1952 for abatement of pollution in Zone 3 of the Delaware River Basin, exclusive of the Schuylkill River Basin, is set forth in Table L. Basic data as of May, 1952 on the sources of municipal and industrial pollution appear in Tables 1 and 2 in the Appendices.

The minimum requirements of Incodel for treatment of wastes discharged into Zone 3 of the interstate Delaware River are as follows:

ZONE 3: 1. Such effluent shall be free of noticeable floating solids, oil or grease, and substantially free of both suspended solids and sleek.

2. Such effluent shall be sufficiently free of turbidity that it will not cause substantial turbidity in the water of the Delaware River after dispersion in the water of the river.

3. Such effluent shall show a reduction of at least fifty-five (55) per cent of the total suspended solids and a reduction of not less than thirty-five (35) per cent of the bio-chemical demand. (It is the intent of this requirement to restore the dissolved oxygen content of the river water in this zone to at least fifty (50) per cent saturation. To accomplish this, it may be necessary in the case of certain wastes, to obtain reductions greater than those required under this item).

4. Such effluent, if it be discharged within two miles of a public water works intake or within prejudicial influence thereof, shall at all times be effectively treated with a germicide.

5. Such effluent shall be sufficiently free of acids, alkalis, and other toxic or deleterious substances, that it will not create a menance to the public health through the use of the waters of the Delaware River for public water supplies, or render such waters unfit for industrial and other purposes; or cause the water of the Delaware River to be harmful to fish life.

6. Such effluent shall be practically free of substances

capable of producing offensive tastes or odors in public water supplies derived from the Delaware River.

In view of the urgent desirability of restoring the waters in this zone to a fifty (50) per cent saturation of dissolved oxygen content in the river water, the New Jersey State Department of Health and the Pennsylvania Sanitary Water Board are requiring a higher degree of treatment of wastes discharged into the Camden - Philadelphia section of Zone 3.

During the post war period of 1946 to 1951 inclusive, four new sewage treatment plants were constructed and six existing plants enlarged to serve a total population of 642,600. During 1951 the new Philadelphia Northeast plant serving 600,000 persons and the Gloucester, New Jersey plant serving a population of 15,600 were placed in operation and seven sewage treatment plants to serve ten sources and a population of about 1,596,000 were under construction. Work is progressing on the Philadelphia Southeast and Southwest plants and the two plants in the City of Camden. Fourteen new industrial waste treatment plants were completed during the same period, three existing plants were enlarged and four plants are under construction. Also five industries connected to the municipal sewer system.

Progress in stream pollution control in Zone 3 of the Delaware River Basin has been steadily advanced for many years. As the pollution control laws in Pennsylvania and New Jersey were amended and strengthened better results in pollution abatement have been obtained. Both States have adequate water pollution control legislation and have made considerable progress in a coordinated program prepared some years ago by representatives of the New Jersey State Department of Health, the Sanitary Water Board of the Pennsylvania Department of Health and Incodel for the control of pollution in this section of the Basin. Much has been accomplished in the reduction of stream pollution in the area. The results of a sanitary survey underway since August, 1949 in this section of the river indicate a gradual increase in the Dissolved Oxygen content and a reduction in the pollution.

With the completion of the construction programs scheduled for the Cities of Philadelphia, Pa. and Camden, N.J. and the projects of the three Authorities in Delaware County, Pa., a considerable step forward will be realized toward restoring the water in Zone 3 of the Delaware River to a quality suitable for the expected principal uses as set forth in the objectives established by Incodel. However, much work remains to be done in providing adequate sewage treatment facilities for other municipalities in need of new or improved treatment plants and adequate waste treatment works to serve various industrial establishments.

It is estimated that the cost of providing the municipal sewage treatment plants, intercepting sewers, pumping stations and related appurtenances to accomplish the stream pollution abatement program in Zone 3 of the Delaware River Basin exclusive of the Schuylkill River Basin will be about $130 million. A part of the program has been completed and approximately $75 million of construction is underway at the present time. Data are not available concerning the cost of the industrial waste treatment facilities which have been constructed or are needed to complete the program of water pollution control in Zone 3.

A statistical summary of the data set forth in the report is shown in the following tabulation.

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Summary Statistics on Pollution
May 1952
Extracted and Condensed from Tables in the Report

	Source of Pollution	
	Municipal	Industrial
Number	70	60
Population Served	2,586,900	

	Existing Waste Treatment Facilities					
	Municipal			Industrial		
	Primary Treatment	Secondary Treatment	No Treatment	Treatment	No Treatment	Undetermined
Number	13	46	11	27	33	-
Popula. Served	143,900	762,300	1,680,700			

	Adequacy of Existing Waste Treatment Facilities					
	Municipal			Industrial		
	Satisfactory	Unsatisfactory	Undetermined	Satisfactory	Unsatisfactory	Undetermined
Capacity	39	19	1	11	5	11
Operation	50	6	3	13	2	12

	Waste Treatment Needs					
	Municipal			Industrial		
	No Project Needed	Project Needed	Undetermined	No Project Needed	Project Needed	Undetermined
Number	38	30	2	14	32	14
Popula.Served	717,550	1,866,750	2,600			

	Current Status of Action on Treatment Needs					
	Municipal			Industrial		
	Under Construction	Planning or Plans Approved	Inactive	Under Construction	Planning or Plans Approved	Inactive or Undeter.
Number	5 (10 sources) 7 sources	14 (16 sources)	4	4	26	2
Popula. Served	1,596,100	193,300	77,350			

CONCLUSIONS

A review of the data contained in the report indicates the following conclusions:

1. In general the tributary streams in Zone 3 of the Delaware River Basin are of satisfactory quality, above the tidal influence of the Delaware River, for all appropriate purposes. The Delaware River and the sections of the tributaries influenced by tidal action are of poor quality, particularly during minimum flow periods in later summer and fall.

2. The coordinated efforts of the New Jersey Department of Health, the Sanitary Water Board of the Pennsylvania Department of Health and Incodel are producing effective results in a comprehensive program for the abatement of stream pollution in the area. Philadelphia and Camden, the principal sources of pollution, are constructing facilities which will provide adequate treatment of their wastes under the existing program. Additional treatment may be required in the future. The program underway provides for the elimination by 1956 of all discharges of pollution which do not meet the Incodel requirements, in order to restore the river water in this zone to at least fifty per cent oxygen saturation.

3. Data concerning municipal sources of pollution are reasonably complete. Additional information is needed concerning the pollution load being discharged to the streams from industrial establishments.

4. Coal culm and silt are sources of pollution and a hindrance to navigation in Zone 3 of the Delaware River. They will continue to adversely affect the River until the Schuylkill River Restoration Project is completed and soil conservation measures are instituted throughout the region.

5. The proposed Incodel water project for the Delaware River Basin to provide for water storage, flood control and regulated increased low flows will improve the condition of Zone 3 of the Delaware River. The development of the proposed channel enlargement between Philadelphia and Morrisville to serve industrial expansion is also a factor that will require investigation to determine its probable effects on stream conditions and ground waters.

6. Activities for informing the public of the necessity for municipal and industrial waste pollution abatement have been fruitful, especially where public approval for financing municipal projects has been necessary.

RECOMMENDATIONS

It is recommended that:

1. The New Jersey Department of Health, the Sanitary Water Board of the Pennsylvania Department of Health and Incodel continue their cooperative program to bring about water pollution control projects in a logical and equitable sequence for restoring and preserving the water resources of the region for their maximum appropriate usefulness.

2. Investigations into the sources of pollution, water use, requirements of water resources for municipal and industrial purposes and stream water quality surveys be continued to enable a reappraisal of improvements resulting from pollution control, the effects of future municipal and industrial expansion on stream conditions and to determine readjustments that may be needed to maintain the streams for their appropriate uses.

3. Efforts be continued toward the development of proper land use practices in the area for water and land resources conservation.

4. Investigation be made to determine the probable effects of the proposed Delaware River channel enlargement between Philadelphia and Morrisville on stream conditions and ground waters.

5. The State agencies charged with controlling stream pollution continue their efforts through public information programs to enlist public support for cleaning up pollution of the streams.

GENERAL DESCRIPTION

Historical Background

The part of the Delaware River Basin upstream from the Pennsylvania-Delaware State boundary to the Pennypack Creek near the upper limits of Philadelphia, referred to as Zone 3 of the Delaware River watershed, is one of the historical centers of the United States.

In 1682, William Penn founded Philadelphia, the cradle of liberty and the focal point of the Revoluntionary War. This was also the beginning of developments in the tidal section of the Delaware which have resulted in the great port of the Delaware River.

Commerce was the first and foremost business of the region, the settlers trading skins, furs, lumber and grain for articles of necessity from abroad.

Lumbering, shipbuilding, iron smelting and farming took their places as contributing factors to the river travel and commerce. As the region developed and the ever-growing population extended into the hinterland, roads, canals and railroads followed the course of development.

The Philadelphia-Camden area became the center of commerce and industry. Today, it is one of the most highly industrialized regions of the United States and the hub of the second largest port in America.

At first, pollution in the river was restricted to the area around the docks and the properties on the banks of the river and tributary streams flowing through the villages. In fact, the first recorded complaint of pollution was made by Isaac Weld, Jr., a young Englishman who visited Philadelphia in 1769, and refers to the "mess" in the harbor.

It was not until 1801 that Philadelphia became the first community in the region to provide a community water supply. Other communities followed Philadelphia's example.

Drainage was forced upon the communities through the necessity of carrying away the used water supply. In 1854 sewers were installed as a unified system and in 1912 the city of Philadelphia put into operation its first sewage treatment works at the mouth of the Pennypack Creek in order to safeguard the water supply taken from the Delaware River within a mile upstream of the sewage discharge.

The history of water supply and sewage collection and treatment in the other communities of the region follows closely that of Philadelphia. Camden, Gloucester, Burlington, Bristol and other municipalities on the river followed a similar pattern of progress.

Physical Description

Zone 3 of the Delaware River is about 30 miles in length and lies in the southeastern corner of Pennsylvania and the southwestern section of New Jersey.

The drainage area contributory to Zone 3 includes the Schuylkill River Basin with an area of 1910 square miles, and an area of 410 square miles comprising the northeastern part of Philadelphia, the lower portion of Montgomery County, a part of Chester County and the major portion of Delaware County in Pennsylvania. In New Jersey, Zone 3 extends from the upper limits of Riverton in Burlington County to Nortonville, near the southern boundary of Gloucester County, encompassing an area of 330 square miles.

The portion of Zone 3 involved in this report comprises 740 square miles which is about 6% of the drainage area of the Delaware River Basin. This region is a part of the coastal plain, ranging in elevation from sea level to approximately 500 feet, with a few hills of higher elevations up to 900 feet.

The underground formations are shallow rock on the Pennsylvania side of the river, with sand and gravel on the New Jersey side.

The open land is well adapted to agriculture and is intensively farmed. Only small areas are forest covered, and these mostly with young growth.

The climate is temperate. The mean annual temperature is about 52°, the average summer temperature being 76.2° and average winter 32.6.° The normal annual rainfall is approximately 43 inches. The normal annual snowfall is 27.4 inches. Precipitation occurs rather uniformly throughout the year. The dryest year of record was 1881, when the annual precipitation was 30.21 inches, while the wettest year was 1873, when the annual precipitation was 55.28 inches, as indicated by the records of the Pennsylvania Hospital. This area is not subject to extensive flood damage.

Stream flows are usually lowest during August, September and October. There are 14 non-recording and three recording precipitation stations and five stream gaging stations in this section of the basin. The gaging stations are located on tributary streams, as this section of the Delaware River is within the tidal range and flows at points along the river must be estimated. A gaging station is maintained at Trenton, in Zone 2 at the head of tidewater where the flow of the Delaware River can be measured. Data concerning stream flows may be found in "Stream Flow Records", issued by the Commonwealth of Pennsylvania, Department of Forests and Waters, Division of Hydrography, Harrisburg, Pennsylvania, and "Surface Water Supply of the United States - Part 1. North Atlantic Slope Basins," issued by the United States Department of the Interior, Geological Survey, Washington, D. C.

The use of ground water for domestic and industrial use in this section is quite extensive, particularly in the Camden metropolitan area and southeastern Philadelphia.

A number of streams enter Zone 3 of the Delaware River. Among those in Pennsylvania are the Pennypack, Wissinoming, Little Tacony, Frankford, Holland, Bow, Darby, Crum, Ridley, Chester and Marcus Hook Creeks and the Schuylkill River. In New Jersey, the Pennsauken, Pochack, Newton, Big Timber, Woodbury, Mantua, Clonmell, Nehonsey, Little Timber and Raccoon Creeks and the Cooper River enter the Delaware River. Other than the Schuylkill River, these streams have relatively small drainage areas, few exceeding fifty square miles. All are located within the tidal estuary and are subject to the influence of the Delaware River, except where low dams have been provided to protect the stream flows from the pollution and salinity in the Delaware River.

Economic Development

Zone 3 includes the center of the most densely populated area in the Delaware River Basin, encompassing the cities of Philadelphia and Camden. The 1950 population is about 2,860,000 of which 2,474,000 reside in Pennsylvania and 386,000 in New Jersey - a population increase of approximately twenty percent over the 1940 figures. The region includes Philadelphia, part of Montgomery and Chester counties, and the major portion of Delaware County in Pennsylvania, in which there are located 63 political subdivisions comprising four counties, two cities, 29 boroughs and 28 townships. In New Jersey, Zone 3 comprises part of Burlington, Camden and Gloucester counties, and includes 36 b boroughs, 22 townships and the cities of Camden, Gloucester and Woodbury.

This portion of the basin is highly industrialized, containing the Philadelphia Naval Base, large shipbuilding yards, many large oil refineries, chemical plants, food processing and packing plants, textile, dye, paper, steel and other satellite industries. Along the river in this zone are concentrated huge shipping facilities for coal, grain and manufactured products and also large steam electric power generating stations located at strategic points.

The commerce statistics of the port of Philadelphia include the region from Wilmington, Delaware, to Trenton, New Jersey; however, the largest portion centers in the Philadelphia-Camden area located in Zone 3. The 1948 figures for the port show arrival and clearances of 14,317 vessels, comprising more than 82 million gross tons. The vast shipping facilities serving these ships are connected with the rail facilities of the Pennsylvania, Reading, and Baltimore and Ohio railroads. Numerous trucking companies supply trucking service between the piers and distant points over an extensive system of city, county and state highways.

Recent development of Venezuelan iron ore deposits, which will be brought by ship to the United States, has brought increased industrial development into the Delaware River below Trenton. The construction of several large steel mills in this region has been the reason for the moving into Zone 3 of numerous satellite industries and the expansion of many others now located in this area. It is believed that this highly industrialized region will have its greatest economic development during the coming decade.

The counties adjacent to the industrialized area of Philadelphia and Camden are intensely cultivated farm lands producing mainly fruits, vegetables, poultry and dairy products. Many of the farm products are shipped to markets in the urban areas for local consumption, while large quantities of fruits, vegetables and poultry are processed in local processing plants for shipment to other markets. There is very little forest land in the area, and this is mostly young growth.

USES OF WATER RESOURCES

The rivers and larger streams in Zone 3 are used extensively for navigation, and municipal and industrial water supplies. In the Pennsylvania portion the vast majority of the communities are supplied with water obtained from surface streams. In the New Jersey area all the public water supplies are obtained from underground sources. Public water supplies are served to about 2,800,000 persons by 31 municipally owned and 21 privately owned systems. The average daily water consumption from these systems in 1949 was 421,104,000 gallons, including that of the City of Philadelphia and the communities served by the Philadelphia Suburban Water Company. Philadelphia serves about 2,040,000 persons and takes approximately one-half of its 340,000,000 gallons daily consumption from the Delaware River at the Torresdale Plant about one mile upstream from Zone 3, and the remainder from the Schuylkill River. The Philadelphia Suburban Water Company which serves an area west of and adjacent to the entire westerly boundary of the City of Philadelphia serves about 300,000 persons and takes approximately 10,700,000 gallons per day from Crum and Pennypack Creeks, tributaries of the Delaware River in Zone 3, and 14,600,000 gallons daily from Neshaminy and Pickering Creeks which are just outside the area covered by this report. The City of Chester, developed a new supply on Octarora Creek outside this basin at a cost of 15 million dollars and placed the new system in operation in November, 1951, at which time the Delaware River Supply was abandoned. Media obtains its supply from Ridley Creek, and West Chester from Chester Creek.

All public supplies from surface streams are filtered and chlorinated and about one-half of those from underground sources are chlorinated. Practically all the population of Zone 3 is within reach of a public water supply. Data on public water supplies are shown in Appendix A.

Industries requiring large volumes of water have as a rule located along the rivers and tributary streams. A recent survey by Incodel shows that the industrial establishments along Zone 3 of the Delaware River and along the Schuylkill River below Fairmount Park Dam in Philadelphia use approximately 2,493 million gallons of water per day. Of this amount the public water supply systems furnish 15 million for domestic use within the industries and 23 million for industrial use. Private wells supply 24 million gallons per day and 2,431 million gallons per day are obtained from the streams. The 1960 water requirements for the existing industrial concerns in this same area are estimated at 3,518 million gallons per day. Most of the water used by the industries is returned to the streams.

The large refineries each require from 20 to 50 million gallons per day of surface and underground water, while the food, paper, textile, chemical and other industries require similarly large quantities. The Philadelphia Naval Base and the shipyards also require millions of gallons daily. Electric generating stations pass hundreds of millions of gallons through their cooling systems every day.

More than a thousand vessels clear the port of the Delaware River each month, carrying cargoes to and from all parts of the world, and to other ports in this country. Zone 3 is the center of this shipping activity. Coal, oil, grain, ore and manufactured products are the chief articles of commerce. A 40-foot channel from the ocean to the Naval Base, and a 37-foot channel to serve the Philadelphia-Camden area provide sufficient depth to carry the largest vessels. Shipping facilities are sufficient to dock large vessels for direct loading and unloading, rail to vessel. Quick turn-about is one of the important factors which make the port desirable. More oil moves through this section of the port than through any other port in the world.

The use of water for agricultural purposes is very limited. Rainfall generally meets agricultural requirements except during periods of severe droughts. There is little use made of irrigation except in the few special instances for horticultural and nursery stock development.

Practically no sport fishing or swimming are available in Zone 3 section of the Delaware River. Sport fishing in the tributary streams, above the influence of the Delaware River has shown a remarkable recovery with the aid of restocking by the States' fish and game commissions.

Commercial fishing, once a large source of income in the region, has practically died out. Shad catches in the Delaware, which were approximately 14 million pounds a year at the turn of the century, reduced to about 38,000 pounds in 1949. It is believed the completion of the treatment works now under construction will improve water conditions so that fish migration in the River will no longer be impeded.

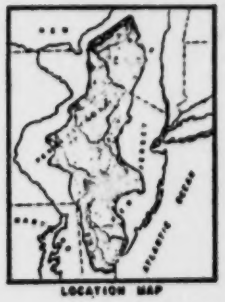
Camping, boating and recreation in the area reached the low ebb about a decade ago. There is some boating at the upper limit of Zone 3 and yachting at the lower limit. However, these boats are moored at the most convenient locations for use in the areas of better water. With the improvement of water conditions in the past several years, more pleasure craft are using or passing through Zone 3.

Incodel in 1949 was authorized by the States of New York, New Jersey and Pennsylvania to conduct an investigation to determine whether it may be advisable for the three States to construct an integrated water project in the Upper Delaware River Basin for their mutual use and benefit. The proposed Incodel Plan for the comprehensive development of the river recommended the establishment by compact of a Delaware River Water Commission with representation from New York, New Jersey, Pennsylvania and Delaware. New York, New Jersey and Delaware have passed legislation authorizing the creation of an interstate compact. Pennsylvania has deferred action pending further study of the plan by the Pennsylvania Water Resources Committee appointed by the Governor. The proposed plan provides for the development of sources of water supply and stream flow regulation to increase the dry weather flows, improve the quality of the water in the lower Delaware and reduce salt water intrusion.

There is also under consideration a proposed project for the Corps of Engineers to enlarge the 31 mile stretch of the Delaware River channel from the Philadelphia Naval Base in Zone 3 to Newbold Island about six miles south of Trenton in Zone 3 to better serve the new Fairless Works of the United States Steel Company at Morrisville, Pennsylvania. The present authorized depth of the channel is 25 to 28 feet, although it has been maintained only to a depth of about 17 feet. The proposed channel will be 40 feet deep and 400 feet wide. Question has been raised concerning the further upstream movement of salinity in the lower Delaware and the effect on ground water resources that may result from construction of the project.

The development of either or both the Incodel plan and proposed Delaware River channel improvement will directly affect conditions in Zone 3 of the Delaware River.

The existing primary water uses and stream status are shown on Map No. 1



LOCATION MAP

EXISTING PRIMARY WATER USES

- DOMESTIC WATER SUPPLY
- INDUSTRIAL WATER SUPPLY
- LIVESTOCK
- GAME FISH
- WILDLIFE
- BATHING WATER
- OTHER RECREATION
- NAVIGATION

PRESENT STREAM STATUS

- SATISFACTORY FOR ALL EXISTING WATER USES
- UNDESIRABLE FOR SOME EXISTING WATER USES
- UNDESIRABLE FOR ALL EXISTING WATER USES

Compiled from data submitted by the respective state water pollution control agencies as of May 1952

DELAWARE RIVER BASIN
Zone 3

PRIMARY WATER USES AND STREAM STATUS

FEDERAL SECURITY AGENCY
Public Health Service
DIVISION OF WATER POLLUTION CONTROL
MAP NO. 1
May 1952

GPO 55-17691

POLLUTION CONTRIBUTED TO WATER RESOURCES

A summary of available data indicates there are 70 municipal sewer systems in Zone 3 of the Delaware River Basin exclusive of the Schuylkill River Basin. These systems serve a population of approximately 2,587,000 or about 91% of the estimated population of the area. (Population figure include that portion of Philadelphia on the Schuylkill River watershed which will be served by the Southwest Plant with discharge into the Delaware River.) These systems also receive the wastes of many industries. Sixty-five of these systems, including those of Philadelphia and Camden, serve a population of approximately 2,572,000 and discharge to the streams a pollution load estimated to be equivalent to that from a population of about 2,267,000. (Table A) not including the undetermined industrial wastes discharged through six major municipal sources in Pennsylvania. Data are incomplete concerning the pollution load discharged from five systems of the smaller communities which serve a total population of about 15,000 or less than 0.5 percent of those in the basin who are served by municipal sewer systems.

The major part of the pollution load is discharged from the sections of Philadelphia and Camden for which sewage treatment plants have not been completed. Philadelphia's southeast and southwest plants now under construction, will each take an initial pollution loading of approximately three-quarters of a million population equivalent which is now being discharged without treatment.

TABLE A

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Sources of Pollution
May 1952

Municipal*

Municipalities	Sources of Pollution (In Number of Municipalities)	Population Served by Sewerage System	Amount of Pollution Discharged to Watercourse (In Terms of Equivalent Number of People**
Having data on pollution load discharged to watercourse	65	2,572,200	2,266,620[a]
Having population data available (Data on pollution load to watercourse incomplete or not available)	5	14,700[b]	- - - -
TOTAL	70[c]	2,586,900	xxxx

*Includes incorporated or unincorporated municipalities, other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers, or other population centers.

**Includes industrial wastes discharged into municipal sewerage systems.

a) Estimate of population equivalent of industrial wastes from six municipal systems in Pennsylvania not available.

b) Population data not available for one source.

c) Includes six municipalities listed as 19 sources:

Philadelphia, Pa. - 3; Camden, N.J. - 5; Delaware Twp., Camden County, N.J. - 2; Haddon Twp., Camden County, N.J. - 5; Pitman, N.J. - 2; and Wenonah, N.J. - 2

At the junction of the Delaware and Schuylkill Rivers, and within the City of Philadelphia, is located the U.S. Naval Base at League Island. The Base is a city in itself, covering over one thousand acres, with a population which varies from 8 to 25 thousand. It includes one of the largest shipyards in the country, an air research and construction center and a naval stores depot, together with the usual base operations. Sanitary sewage is discharged into the Philadelphia municipal sewer system and will be treated in the city's southwest treatment plant. Industrial wastes are discharged untreated but this problem is under study.

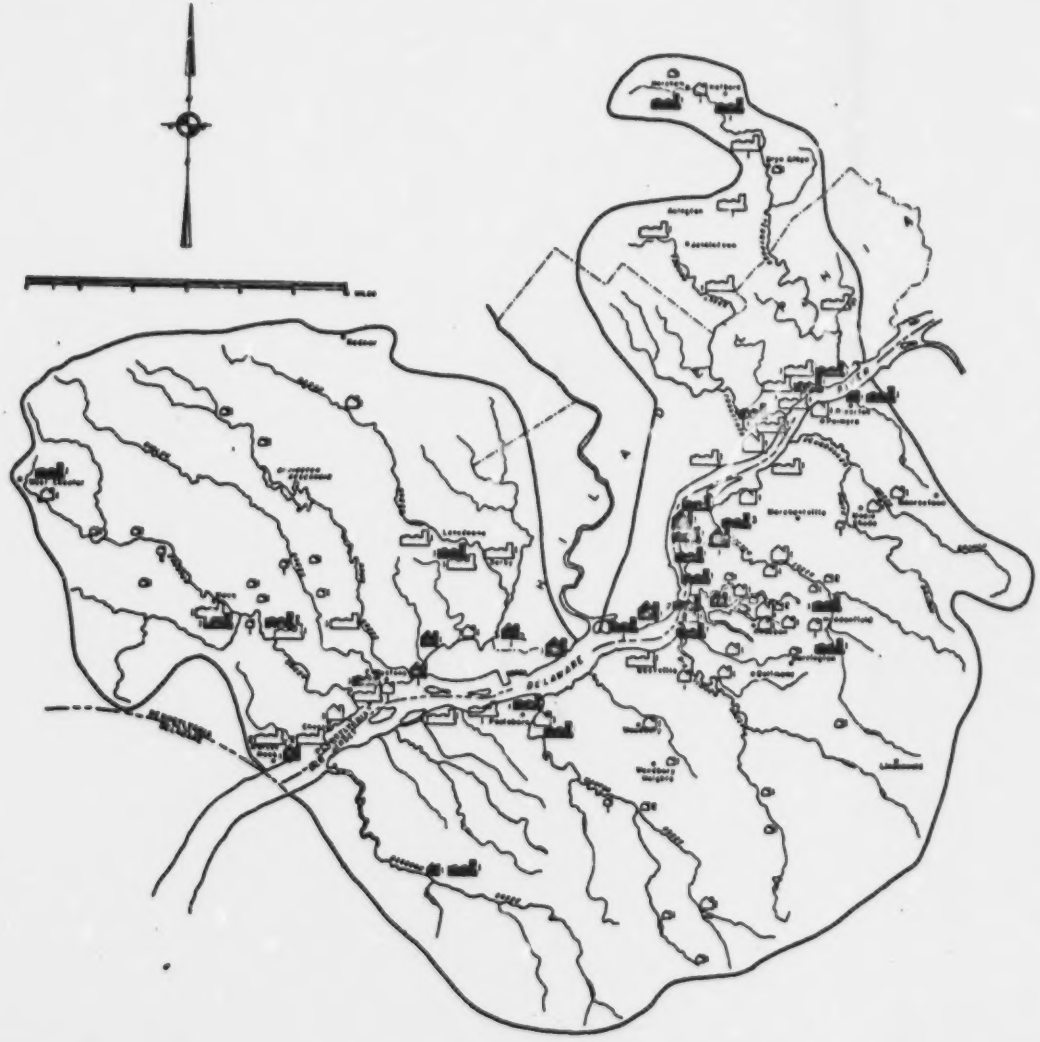
In Delaware County, which bounds Philadelphia on the south, some 35 municipalities contribute wastes having a pollution load equivalent to that from a population of approximately 200,000.

The Camden sewer system serves about 124,000 persons in the city of Camden and a portion of Pennsauken Township and some 300 or more industrial establishments and discharges a pollution load having a population equivalent of about 417,000. Treatment of these wastes will be provided for in the new Main Plant and enlargement of the existing Baldwin Run plant, both of which are under construction.

Wastes from 60 sources of pollution contributed by 58 industrial establishments are discharged directly to the streams. These establishments consist of 55 sources which produce organic wastes and include five which also produce inorganic wastes, and five which produce only inorganic wastes. (Table B).

Data concerning the population equivalent of the industrial waste discharges are not available in most cases. However, 18 establishments including one with a separate sewage treatment plant, discharge a pollution load having a population equivalent about 394,000. These establishments consist of six Chemical, four Petroleum and Coal, three Food, one Textile, two Paper, and two miscellaneous industrial plants.

Map No. 2 shows the sources of pollution and existing treatment facilities.



LOCATION MAP

SOURCES OF MUNICIPAL POLLUTION

POPULATION EQUIVALENT (P.E.B.) OF WASTES DISCHARGED TO STREAM

- 1,000 AND UNDER
- 1,000 - 10,000
- 10,000 - 100,000
- 100,000 AND OVER

SOURCES OF INDUSTRIAL POLLUTION

INDICATES INDUSTRIAL SOURCE OF POLLUTION WITH DIRECT DISCHARGE TO STREAM. POPULATION EQUIVALENT (P.E.B.) OF WASTES DISCHARGED IS NOT INDICATED.

TREATMENT FACILITIES STATUS

- TREATMENT FACILITIES PROVIDED
- NO TREATMENT FACILITIES

NOTE -

Numbers next to symbol indicate total number of sources of pollution in the area in the category designated.

Compiled from data submitted by the respective state water pollution control agencies as of May 1958

DELAWARE RIVER BASIN
Zone 3
SOURCES OF POLLUTION AND EXISTING TREATMENT FACILITIES

FEDERAL SECURITY AGENCY
Public Health Service
DIVISION OF WATER POLLUTION CONTROL
MAP NO. 2
May 1958

GPO 58-12682

TABLE B

DELAWARE RIVER BASIN-- ZONE 3

(Exclusive of the Schuylkill River Basin)

Sources of Pollution
May 1952

Industrial*

Industries	Sources of Pollution (In Number of Plants)	Amount of Pollution Discharged to Watercourse (In Terms of** Equiv. No. of People
Producing Organic Wastes	18[a]	394,160
Producing Organic Wastes	37[b][c]	Undetermined
Producing Inorganic Wastes	10	Not Applicable
Producing Wastes of Undetermined Type	-	Undetermined
TOTAL	60[d]	xxx xxx

* Industries having separate outlets discharging wastes directly to watercourse. The wastes from industries which discharge into a municipal sewer system are included in the municipal discharge in Table A.

a) Includes one separate sewage treatment plant at a dairy farm.

b) Includes five plants also listed as producing inorganic wastes.

c) Includes one separate sewage treatment plant at a Fabr. Metals industrial plant.

d) Total adjusted to correct for duplication noted in (b).

** Equivalent Population - The calculated population which would normally contribute the same amount of biochemical oxygen demand (B.O.D.) per day. A common base is 0.167 lb of 5-day B.O.D. per capita per day.

DAMAGES TO WATER RESOURCES FROM POLLUTION

The greatest damage due to pollution in the entire Delaware River Basin has probably occurred in Zone 3.

First and most outstanding, not only from a dollar value but from an esthetic standpoint as well, is the damage to domestic water supply sustained by the City of Philadelphia. The City has been, and still is, required to use practically every known means of water treatment, especially those for the prevention of tastes and odors, in its public water supply. The cost of chemicals for the water department is more than $650,000 a year. In addition, the City has installed the largest ozonation plant in the world at the Belmont filters at a cost of approximately $1,000,000. The operation of the ozonation plant has not been of long enough duration to establish the overall operating cost. However, the treatment of the water with ozone will add materially to the total cost of overcoming difficulties caused by pollution of the streams used as sources of public water supply.

Zone 3 contains some of the largest industries located along the river because of their industrial water needs and shipping requirements. These, too, are affected by the poor quality of the river water and are subject to the expense of treating the water to make it suitable for plant processes. Water treatment costs to industrial plants have been known to run as high as $90 per million gallons during seasons of low stream flow. It has been found that the equipment in water cooling systems, which use the river water, depreciated 25% to 50% more rapidly than is expected when water of good quality is obtainable, and maintenance and operating expenses are much higher than normal.

The pollution in Zone 3 of the Delaware River in 1944 was considered by the authorities of the Philadelphia Naval Base as harmful to the health of the personnel working at the Base, as well as to the material on the ships at the waterfront and on the shore installations. It was estimated that upkeep maintenance at the Base was 30% to 40% higher than in other areas where this condition did not exist.

At one of the larger manufacturing establishments the chemical cost of water treatment increased 300% due to the increased pollution in the Delaware River. The gases and fumes emanating from the river reduced the life of electrical machines and equipment by about 50% and also doubled the cost of maintenance. Paint, piping and other equipment were also adversely affected.

It was also reported by one industry that the number of rejects of its product increased by 10% above that experienced in another of its plants with similar production capacity located in an area not subject to the effects of pollution.

Real estate along the river is also depreciated because of pollution. Wood, concrete and steel structures definitely deteriorate as a result of the polluted waters and the effects of the gases amanating

rom the sludge banks on the river bottom. Another effect of pollution s the filling of pier slips with sludge from some 30 or 40 outfall wers and with silt carried by the tidal action of the river. This oaling of pier slips increased the cost of commerce and navigation and ated insanitary conditions which made it necessary to house the crews in uptown hotels while in port, thus causing additional expense in operations.

Boatyards and yacht basins, which at one time were quite numerous in this section of the river, are now out of business or moved to other locations. Yacht owners do not patronize this section of the river.

Discharges of domestic and industrial wastes, together with occasional slugs of oil from bilges and other sources, destroyed fish life and recreational facilities in this region.

Reports of the United States Soil Conservation Service indicate large quantities of soil are being carried by the tributary streams and from upstream areas into Zone 3 of the Delaware River. This is supported by the fact that the Corps of Engineers continuously operate dredging equipment in order to maintain channel depths. Approximately 20 million yards of silt are dredged from the river every year at a cost of three to four million dollars.

Another factor which must be considered is the salt content of the water. Those industries between Philadelphia and Marcus Hook which require a good quality of water for industrial purposes must install equipment for removing the high concentration of salt during periods of low flow in the river. When the salt content in the supply is above 200 p.p.m. it is not economical to operate this equipment and the plant must shut down or haul water from some other source. The cost of shutdowns due to salinity intrusion, which happens almost every summer, are estimated to average about $700,000 a year.

BENEFITS RESULTING FROM POLLUTION PREVENTION AND ABATEMENT

The coordinated program of the Interstate Commission on the Delaware River Basin being carried out by the New Jersey State Department of Health and the Pennsylvania Sanitary Water Board in conformity with the Reciprocal Agreement for the control of pollution in the waters of the interstate Delaware River, and supported by other interested agencies, is eliminating the sources of pollution. It is believed that by 1956 the river will have reached a degree of recovery which will restore the dissolved oxygen content of the river water in Zone 3 to at least 50% saturation at all times.

Each step in attaining this degree of recovery is providing a better water for domestic and industrial water supplies and reduces the cost of water treatment.

A sanitary survey of the Delaware River in this area underway since August 1949 by the City of Philadelphia, the U. S. Geological

Survey, and Incodel indicates improvement in the stream during the period of the survey. There has been a decrease in odors, an increase in the dissolved oxygen in many portions of the stream and a general improvement.

Industries are benefiting from longer life of water equipment with resulting lower costs. A number of them have developed recovery processes which have reduced or eliminated pollution. In some cases the recovery of materials has netted financial returns as in the recovery of distillery wastes which are processed into cattle feed. Usable oil is recovered from the waste waters at the refineries and materials which can be reused are being reclaimed from the waste waters of the paper manufacturing plants.

It is already evident that the improvement in the quality of the river is reducing the depreciation of real estate and enhancing property values. The Hog Island area is being reclaimed and developed for industrial and residential purposes. In the lower Darby Creek area in South Philadelphia an area of 2,000 to 3,000 acres will be reclaimed for a proposed housing redevelopment project. In the Riverside and Riverton sections in New Jersey there is increased use of summer housing and in some cases summer housing which had formerly been abandoned because of pollution conditions in the river is being reoccupied and has increased in value.

Stream pollution control measures undertaken in the past five years have improved conditions for the return of fish life. It has been reported that the numbers of mackerel, shad and herring have increased and fish are passing through Zone 3 to and from better waters of the upper river and the bay. During the spring of 1951 shad swimming up from the Delaware breakwater were reported in the vicinity of National Park, New Jersey after an absence of more than 30 years. Fingerling shad were found in the river above Milford in Zone 1, about 125 miles above Philadelphia . In the past the young shad returning downstream could not survive the pollution encountered in the metropolitan area. It has been reported there are sufficient shad in the area to reproduce and return shad fishing to the Delaware within a few years after the stream has been improved to the point where the young shad will survive.

With the restoration of the river to a degree of respectability the recreational facilities, particularly boating, which formerly supported many smaller boatyards and supply houses, will again become popular and increased use of the river for general recreation purposes is expected. Present evidence of this is the increased activity at various clubs such as the Corinthian Yacht Club in Essington, Pennsylvania and the Riverton Yacht Club in New Jersey.

The removal of silt from the upper Schuylkill River by the State of Pennsylvania in its program to clean up that stream, has reduced the amount of coal silt which reaches the Delaware River and was formerly carried by tidal action upstream in the Delaware. Programs for proper land use in the region and the elimination of sewer outfalls which will be connected to the intercepting sewers extending to the new sewage

treatment plants will eliminate the formation of sludge banks and the shoaling of channels from these sources. Such measures will also reduce the cost of channel and slip maintenance, and provide better navigation conditions in the river.

POLLUTION PREVENTION MEASURES IN EFFECT

In Zone 3 of the Delaware River Basin, exclusive of the Schuylkill River Basin, there are 51 municipalities operating 59 sewage treatment plants which serve a population of approximaterly 906,000. Thirteen of the treatment plants provide primary treatment and serve a population of about 143,900 in 12 municipalities. Forty-six secondary treatment plants serve about 762,300 persons in 40 municipalities, one of which also has a primary treatment plant. (Table C)

No treatment facilities are provided for 11 municipal systems which serve a population of 1,680,700 in eight municipalities, or 65% of the total population in Zone 3 served with municipal sewer systems. These largely represent the population which will be served by the Southeast and Southwest sewage treatment plants of the City of Philadelphia, both of which are under construction; those to be served by the two sewage treatment plants under construction by the City of Camden, New Jersey which will provide for a population equivalent of 446,000 including industrial wastes; and some 200,000 persons to be served by the proposed treatment plants of the several Authorities in Delaware County, Pennsylvania.

The new Northeast sewage treatment plant of the City of Philadelphia was placed in operation in April, 1951. It is designed to serve an ultimate population of 876,000 and to treat a sewage flow of 125 million gallons per day. The plant will provide a reduction of 75% of the pollution load before discharge of the effluent into the Delaware River. At present this plant is serving a population of about 600,000 and is providing a somewhat higher degree of treatment on a flow of 90 million gallons per day.

TABLE C

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Existing Treatment Facilities
May, 1952
Municipal

Degree of Treatment Provided	Number of Municipalities* Served	Number of Treatment Plants	Population Served
Primary	12	13 a)	143,900
Secondary	40	46 b)	762,300 e)
No Treatment	8	11 c)	1,680,700
TOTAL	57 d)	70	2,586,900

* Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns; significant institutions, resorts, recreational centers, or other population centers.

a) Includes Camden, N.J. - Fairview Section and Baldwins Run Plant
Haddon Twp., Camden County, N.J. - Bluebird Section Plant

b) Includes Delaware Twp; Camden County, N.J. - Colwick and Erlton Sections Haddon Twp., Camden County, N.J. - Bettlewood, Cuthbert Road, West Collingswood and Westmont Sections

Pitman, N.J. - Plants Nos. 1 and 2
Wenonah, N.J. - Princeton Ave. and Mantua Ave. Plants
Philadelphia, Pa. - Northeast Plant

c) Includes Camden, N.J. - 3 sources
Philadelphia, Pa. - 2 sources

d) Total adjusted to correct for multiple listing of Camden, N.J.; Haddon Twp., Camden County, N.J.; and Philadelphia, Pa.

e) Population data not available for one source

In Delaware County, which bounds Philadelphia on the south, some 23 municipalities have joined to form three Authorities, seven of the municipalities each being members of two Authorities because of their location on two drainage areas. The Authorities were formed to plan finance, construct and operate sewage collection and treatment facilities for approximately 164,000 people. Construction of miles of intercepting

sewers by the Authorities is practically completed. Final plans of the Darby Creek Joint Authority and the Muckinapattus Creek Authority for complete treatment facilities have been approved and construction ordered by the Pennsylvania Sanitary Water Board, and the projects are soon to be advertised for bids. The primary treatment project of the Central Delaware County Authority to serve eight communities is under construction.

Across the Delaware River in the New Jersey section of Zone 3, there are 61 political subdivisions with a population of approximately 376,000. Thirty-two of these subdivisions have sewage collecting systems of which 28 are provided with treatment plants.

The City of Camden, New Jersey, with a population of approximately 126,000, has practically completed the reconstruction of its Baldwin Run Plant except for some pumping equipment and also has a new Main Plant under construction scheduled for completion in 1955. These plants will provide treatment for some 137,500 residents of the City of Camden and Pennsauken Township served by the city sewers. They will also provide for treatment of industrial wastes having a population equivalent of 308,400. These plants will reduce the pollution on the river by providing a reduction of about 51,600 pounds of B.O.D. per day in the effluents before discharge to the streams.

About two miles downstream from Camden, the City of Gloucester, New Jersey with sewerage facilities serving a population of 15,600, recently placed in operation a new sewage treatment plant of 4.5 m.g.d. capacity. Under present day loading of about 50% capacity the plant delivers an effluent of secondary treatment standards with an 82% reduction in the pollution load before discharge to the river. The wastes from nine industries are treated in the municipal plant. Six other industries in the municipality are constructing their own treatment facilities.

Twenty-six of the industrial establishments are served by 27 treatment facilities, including two with separate sewage treatment plants. No industrial waste treatment facilities are provided for 33 establishments (Table D). It is to be noted that 47% of the sources of pollution consist of chemical establishments and those producing petroleum and coal products. Other industries, listed in order as to the number of sources of pollution, are textiles, food, metals, miscellaneous, paper and mining.

Of twenty industries in the northeast section of the City of Philadelphia which were cited by the Sanitary Water Board for discharging their industrial wastes into the river or tributary streams, four have connected to the city sewers and four have permission to make connection. Four establishments are negotiating with the City for permission to discharge their waste waters into the municipal sewers, one after providing pretreatment. Four industries constructed satisfactory waste treatment facilities, one establishment is constructing treatment facilities, one is studying additions to existing works, one is making internal process changes to reduce pollution, and one is in the active planning stage.

TABLE D

DELAWARE RIVER BASIN – ZONE 3

(Exclusive of the Schuylkill River Basin)
Existing Treatment Facilities

May, 1952
Industrial*

Type Industry	Number of Plants	No. of Industrial Plants Having: Treatment Facilities	No Treatment Facilities	Undetermined Facilities
Food	6 (7 sources) **	1 a)	6	-
Textile	8	1	7	-
Paper	5	4	1	-
Chemical	16	5	11	-
Petrol. & Coal	12	10	2	-
Primary Metals	1	-	1	-
Fabricated Metals	4 (5 sources)	4 b)	1	-
Mining	1	1	-	-
Miscellaneous	5	1	4	-
TOTAL	58 (60 sources)	27	33	-

a) Separate sewage treatment plant at a dairy farm

b) Includes a separate sewage treatment plant

* Industries having separate outlets discharging wastes directly to watercourse

** Includes 2 canneries, 2 abattoirs and 2 dairies (one with treatment of sewage only)

A number of the industries listed in the groups in Table D are located along the river in South Philadelphia and Camden downstream to the lower limit of Zone 3 at the Pennsylvania-Delaware state line. Here are located most of the oil refineries. This industry has done an outstanding job of pollution abatement, having spent approximately $20,000,000 for waste recovery plants. Waste treatment facilities are provided at the four paper manufacturing plants and the chemical plants are making progress in providing waste treatment facilities.

One of the outstanding abatement projects was the restoration of the Schuylkill River above Norristown by the Commonwealth of Pennsylvania at a cost of 35 million dollars and the installation by the coal

companies of desilting facilities at the coal processing plants. The Federal government is committed to complete the desilting work from Norristown to the Delaware River, but to date only limited appropriations have been made to initiate the work by the Corps of Engineers, Department of the Army. In times of flood, millions of tons of coal culm and silt have been washed into the Delaware River and carried by tidal action the entire length of Zone 3. Since the completion of the dredging project above Norristown it has been reported that the amount of silt carried downstream into the Delaware River has been greatly reduced.

Thirty-nine of the existing 59 municipal sewage treatment plants in Zone 3 are considered to be of adequate capacity to provide the degree of treatment required, 19 are inadequate and one is undetermined. (Table E) The plants with satisfactory capacity serve approximately 726,000 persons or about 80% of the population in Zone 3 now served with sewage treatment plants. Fifty of the 59 plants are operated satisfactorily; these serve about 868,000 persons or about 96% of those provided with treatment facilities.

TABLE E

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Adequacy of Existing Treatment Facilities

May 1952
Municipal*

Number of Municipal Treatment Facilities	Adequacy with Relation to: Capacity			Operation		
	Satisf.	Unsatisf.	Undetermined	Satisf.	Unsatisf.	Undetermined
Plants 59	39	19	1	50	6	3
Population Served						
906,200(a)	726,350(a)	178,650	1,200	868,000(a)	16,500	21,700

* Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns; significant institutions, resorts, recreational centers or other population centers.

(a) Population data not available for one plant

Table F indicates there are 27 waste treatment facilities, including two separate sewage treatment plants at industrial establishments, the effluents from which are discharged directly to a watercourse. Data are not available concerning the population equivalent of the effluents discharged from most of these treatment works. However, the information reported indicates nine of the existing industrial waste treatment works and the two separate sewage treatment plants at industrial establishments provide the required degree of treatment. The capacities of the waste treatment facilities at five industries are unsatisfactory and have not been determined at eleven establishments. Operation of eleven industrial waste treatment works and two separate sewage treatment plants is satisfactory. Two existing treatment works are operated unsatisfactorily and the operation of treatment facilities at twelve establishments is undetermined.

TABLE F

DELAWARE RIVER BASIN * ZONE 3
(Exclusive of the Schuylkill River Basin)

Adequacy of Existing Treatment Facilities

May 1952
Industrial*

Number of Industrial Treatment Facilities	Adequacy with Relation to:					
	Capacity			Operation		
	Satisf.	Unsatisf.	Undetermined	Satisf.	Unsatisf.	Undetermined
27 a)	11 a)	5	11	13 a)	2	12

* Industries having separate outlets discharging wastes directly to watercourse.

a) Includes two separate sewage treatment plants.

During the period 1946 to 1951 inclusive four new sewage treatment plants were constructed and six existing plants were enlarged to serve a total population of 642,600. During 1951 the new Philadelphia Northeast treatment plant serving 600,000 persons and the Gloucester City, New Jersey plant serving 15,600 persons were placed in operation. Six sewage treatment plants now under construction in four municipalities will serve a population of 1,585,300. These are the Southeast and Southwest plants in Philadelphia to serve a total population of 1,408,500, the new Main Plant and additions to the Baldwin Run plant in Camden, to serve about 123,500 persons, enlargement of the City of West Chester, Goose Creek Plant to serve 6,000 and the xonstruction of the primary treatment project of the Central Delaware County Authority to serve 47,300. The intercepting

sewers to serve the three Municipal Authorities in Delaware County, Pennsylvania are practically completed. In Philadelphia the intercepting sewer along Pennypack Creek has been completed to City Line and work is proceeding on the interceptors to the Southeast and Southwest Plants. The program for the City of Philadelphia for the new Northeast treatment plant, the two plants under construction and the interceptors is estimated to cost $60 million. The City of Camden's program will cost approximately $17 million.

Fourteen new industrial waste treatment works and three enlargements were constructed during the period 1946-1951 (Table G). In addition to those industries which constructed treatment works there were five others which connected to the municipal sewers the wastes from which are now receiving treatment at the municipal sewage treatment plants.

TABLE G

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Progress in Construction of Pollution Abatement Facilities

	Municipal		Industrial	
Year	Sewage Treatment Plants Completed	Design Population	Waste Treatment Plants Completed	Amount of Waste Treated (In Terms of Equiv. No. of People)
1946	-	-	1	
1947	1*	4,900	1	Data
1948	-	-	1	
1949	-	-	2(1*)	not
1950	3(1*)	6,900	8(1*)	
1951	6 (4*)	630,300	4(1*)	available

In addition five industrial establishments in Philadelphia, Pa. connected to the municipal sewer system and abated direct discharges to the streams.

* Enlargement or additions

The control of wastes discharged into the waters of Zone 3 of the Delaware River and its tributaries is under the jurisdiction of the Department of Environmental Sanitation, New Jersey State Department of Health and the Sanitary Water Board of the Pennsylvania Department of Health. Each State has laws controlling the discharge of wastes into the waters of the respective States. In addition thereto the States have enacted reciprocal legislation known as the Incodel Act, which provides minimum treatment requirements for all wastes discharged into the Delaware

River and the maintenance of the waters of any intrastate tributary of the Delaware immediately above its confluence with the Delaware River in condition at least equal to that in the Delaware River immediately above the confluence of such tributary. The Incodel laws enacted in these two States are New Jersey - Chapter 146, July 1, 1939 and Pennsylvania - Chapter 123, April 19, 1945. There is close cooperation between the State health departments and Incodel, with Incodel acting as the coordinating agency.

Pollution prevention measures in New Jersey are based upon two laws, both enacted in 1899 and later amended and supplemented. One of these laws, "An Act to secure the purity of public supplies of potable waters", prohibits the discharge of excremental matter, industrial wastes or other polluting matter into water later used for potable purposes; as well as the deposition of such materials upon the banks of such waters. However, "An Act to regulate the discharge of effluents from sewage systems or works into potable waters," (Act of 1921) provides that effluents from sewage and industrial waste treatment plants may be discharged into waters later used for public potable purposes; provided, that, in the opinion of the State Department of Health, such effluents discharged will or may not cause or threaten injury to the users of any of such waters. The second law, the State Sewerage Act, applies to all waters of the State with the exception of the territory of the Passaic Valley Sewerage District. Under the provisions of this law, the State Department of Health is granted the following authority; (1) to investigate the various methods of sewage or waste disposal in order that it may make proper recommendations in regard thereto; (2) to require alterations, additions or improvements to sewage or industrial waste treatment works; (3) to establish the conditions under which any sewer, drain or sewerage system shall be built; and (4) to establish the conditions under which any plant for the treatment of sewage or other polluting substance shall be built or operated. The law provides, further, that before the building of any plant for the treatment of sewage or other polluting substances, the plans shall be submitted to the State Department of Health for approval. If the waste treatment facilities are not constructed or the contract awarded for such construction within two years from the date of approval then new plans must be submitted for approval.

The program for abatement of stream pollution in Pennsylvania is conducted by the Sanitary Water Board, an agency within the Department of Health, under the Pennsylvania Anti-Pollution Act of 1937 as amended in 1945. The first phase of the program which involves the issuance of orders to municipalities and industries which are polluting the waters of the State to abate the discharges of such pollution or submit to the Board plans of corrective measures for approval is practically completed in Zone 3 of the Delaware River Basin. The second phase is concerned with the construction and operation of the required waste treatment facilities. Following approval of the detailed plans the Board issued orders requiring construction and operation of the approved facilities on or before specified dates. This phase of the program in Zone 3 of the Delaware River is also well advanced. New or reopened industrial establishments must provide for adequate waste treatment before beginning operations.

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To assist in the first phase of its program, the State of Pennsylvania after the issuance of a permit approving the plans for sewage treatment, makes Grant-in-Aid payments to the municipalities, from State funds, up to 50% of the cost of the plans for sewage treatment works, based upon the 1942 price level. The Grant-in-Aid is toward the cost of the plans for sewage treatment works, including intercepting sewers, pumping stations and related appurtenances but not lateral collecting systems. Thus far about $112,000 Grant-in-Aid has been paid to the municipalities in Zone 3. No funds are provided to assist in the construction of such facilities.

Specific standards have been adopted by the Pennsylvania Sanitary Water Board for certain industrial wastes including milk processing wastes, colliery silt, acid pickling waste waters, wastes arising from the manufacture of pulp, paper, paper board and similar products, oil and natural gas wells, wastes from other wells, phenolic bodies, oil bearing wastes, distillery wastes, tannery waste waters and mine drainage. The discharge of cyanides to the waters of the State is prohibited. In general the standards set forth values representative of standard raw waste characteristics which serve as the basis upon which the required degree of treatment is applied.

Provisions governing financing the construction and operation of municipal sewage treatment plants are contained in the laws of the respective States.

The debt limit in New Jersey is 7% of the average assessed valuations of real property including improvements for municipalities and 4% for counties. A municipality with indebtedness over the limit may incur new debt only within the limitations of the statute, which in brief are the orders of a superior governmental authority such as an order of the State Department of Health to construct a sewer, capital debt for emergency purposes such as fire, flood or other disaster, the refunding of floating debt with the consent of the State Funding Commission, and the incurring of general debt based on the amount of debt retired in a prior year. The latter is a limited power provided by statute to take care of cases where certain capital expenditure should be incurred which do not fall in any of the exempted classifications. A municipality may incur debt in excess of statutory limitations, if it has been found by the State Department of Health, and an order issued, that the expenditure is necessary to protect the public health and to prevent or suppress a present meance to the public health of sufficient gravity to justify the incurrence of the debt, and that no less expensive method of preventing or suprressing such menace exists.

The Anti-pollution Laws of Pennsylvania contain provisions relating to the financing of the construction of municipal sewage treatment plants. Municipalities which are ordered to construct sewage treatment plants and do not have sufficient funds on hand must acquire such funds through a bond issue. If direct obligation bonds cannot be issued because of constitutional debt limitations or failure to get consent of the electors financing can be done by the establishment of a Municipal Authority to construct, improve, maintain and operate sewers and sewage

treatment works. A Municipal Authority is created by the governing body of the governmental subdivision by passage of an ordinance and the members of the Authority are appointed by the governing body which creates the Authority*. The existence of an Authority is limited to 50 years and it must procure a charter from the State before it can operate. In such cases a system of sewer rental charges is practically always adopted as the method for financing the sewage treatment facilities. The Pennsylvania Supreme Court in a recent case ruled that Municipal Authorities may assess charges against adjoining property owners to defray the expense of building a sewer. Financing of industrial waste treatment facilities is entirely the responsibility of the industry. In the case of the marginal industry operating in keen competition, the cost of treatment facilities is sometimes a major item of expense.

Soil erosion is moderate in several portions of Zone 3 covered in this report. Moderate sheet erosion exists in a portion of Chester and Delaware Counties in Pennsylvania. In the northeastern and southern parts of Zone 3 in New Jersey moderate sheet and slight wind erosion with occasional gullies exist. Soil conservation districts have been established in the New Jersey section of the basin and in Chester County, Pennsylvania. Through the activities of the State Extension Services and the U.S. Soil Conservation Service progress is being made in soil and forest conservation. The agencies chiefly responsible for better forest conservation are the State forestry departments, namely, The Pennsylvania Department of Forests and Waters and the New Jersey Department of Conservation, Division of Forestry. Incodel in cooperation with these agencies is active in the development of conservation projects particularly on the small watersheds in the area.

The Interstate Commission on the Delaware River Basin has no enforcement powers. It is engaged in the formation and execution of a coordinated, unified plan looking toward the wise use, development, and control of the resources of the Delaware River Basin as a whole. Through its cooperation with federal, State and numerous local agencies and organizations substantial strides are being made in the pollution control program in Zone 3 of the Delaware River Basin. Effective educational work is carried on to acquaint the public with the problems to be solved and procedures for accomplishing the control of pollution and development of the overall program in the basin.

In Pennsylvania the Sanitary Water Board has an extensive educational program underway to enlist the support of the public and industry in the Boards program to control pollution of the streams. This activity is conducted through the use of periodicals, colored posters, mailing leaflets, special articles for technical publications, motion pictures, radio, press, working models of installations, the extensive use of photographs and by participation in meetings of civic, technical and other educational groups.

* Financing Sewage Treatment Works - Pamphlet issued by the Sanitary Water Board, Pennsylvania Department of Health.

In New Jersey surveys and corrective action in pollution abatement are progressing.

A cooperative sanitary survey of the Delaware River by the City of Philadelphia Water Department, the U.S. Geological Survey and Incodel has been underway since August 1949 in this area. Five samples are collected monthly at each of eight sampling stations on the section of the river extending from the Burlington-Bristol Bridge to the Pennsylvania-Delaware State line. Analytical data have not been correlated with stream flow records and other conditions but the results do indicate an improvement in the quality of the water during the period of the survey.

Pollution abatement in Zone 3 of the Delaware River Basin has advanced considerably in the past few years. At present municipal pollution abatement projects which cost about 75 million dollars are under construction. Data are not available concerning the cost of industrial waste treatment facilities. The degree of treatment required by New Jersey and Pennsylvania in the Camden-Philadelphia-Gloucester section of Zone 3 of the Delaware River is higher than the minimum requirement of Incodel for Zone 3. Many improvements have been completed and programs are under way to continue these activities.

POLLUTION PREVENTION MEASURES NEEDED

In Zone 3 of the Delaware River Basin, exclusive of the Schuylkill River Basin, nine new sewage treatment plants for eleven sources are needed to serve a population of 1,680,700 or about 65% of the total population in the area which have municipal sewer facilities. (Table H). Seventeen existing plants which serve a population of about 182,000 are in need of enlargement or additions and two plants serving 3,700 need replacement. Thirty-eight plants which serve a population of approximately 718,000 or about 28% of the population served with municipal sewer facilities, are adequate and need no projects. The treatment needs of two plants which serve 2,600 have not been determined.

Treatment plantsneeds to serve the major part of the population will be met upon the completion of the Philadelphia Southeast and Southwest plants, and the new Main plant and enlarged Baldwin's Run plant of the City of Camden, now under construction.

The Authorities in Delaware County, Pennsylvania consisting of the Central Delaware County Authority, Darby Creek Joint Authority, and the Muckinapattus Creek Authority have completed and approved plans for financing and constructing three new plants for treating wastes from a population of 200,000 and the primary treatment project of the Central Delaware County Authority is under construction. The Lower Delaware County Sewer Board has plans and a financing program in the course of preparation.

TABLE H

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Waste Treatment Needs - Municipal*
May 1952

Needs	Number	Population Served by Facilities
New Plant	11[a]	1,680,700
Enlargement or Additions to Existing Plant	17[b]	182,350
Replace Existing Plant	2[c]	3,700
No Project Needed	38	717,550[d]
Undetermined	2	2,600
TOTAL	70	2,586,900[d]

* Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns; significant institutions, resorts, recreational centers or other population centers.

a) Includes Camden, N.J. listed as new plants for each of three sources but which will be served by the new Main Plant under construction.

b) Includes Haddon Twp., Camden County, N.J. - Bluebird Section Plant which will be abandoned; Area to be served by Westmont Section Plant.

c) Includes Camden, N.J. - Fairview Section Plant which will be abandoned upon completion of the new Main Plant.

d) Population data not available for one plant.

The other municipalities without treatment facilities are Riverton and Swedesboro, New Jersey, both of which are under orders to abate stream pollution. Swedesboro has plans under preparation and Riverton has submitted plans to the New Jersey State Department of Health for approval.

Of the 17 sewage treatment plants in need of enlargement or additions, two serve institutions and 14 serve municipalities. Three of the municipal plants, Camden, New Jersey - Baldwins Run Plant,

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Moorestown Twp., New Jersey, and West Chester, Pennsylvania - Goose Creek Plant have enlargements and additions under construction and other municipalities are considering methods of financing the necessary improvements. The larger municipalities which have final plans approved or are in the active planning stage include Collingswood, Haddon Heights, Merchantville-Pennsauken, and Palmyra in New Jersey, and Radnor-Haverford and Upper Moreland Township-Hatboro in Pennsylvania.

Two plants need replacement. One of these, the plant serving the Fairview Section of Camden will be abandoned and the system will be served by the new Main treatment plant being constructed in south Camden. The other is the Haddon Township, New Jersey, Westmont Section plant for which final plans have been approved including a pumping station and force main to serve the Haddon Township, Bluebird Section where an existing plant in need of additions will be abandoned.

Data concerning industrial waste pollution abatement needs (Table I) indicate that corrective measures are needed at 32 industrial establishments or about 53% of those which discharge wastes directly to the streams in the basin. Of the 32 establishments in need of pollution control measures, 17 need new waste treatment plants or other control methods, five industries need enlargement or additions to existing treatment facilities, five have permission for disposal of wastes into the municipal sewer systems and treatment works, four are negotiating to enter the municipal systems, and one establishment studying corrective measures will probably take similar action. Thirteen establishments which contribute wastes from 14 sources, two of which have separate sewage treatment plants, and four chemical plants which discharge untreated industrial wastes having a combined population equivalent of 810 and are not in need of projects. Information is incomplete concerning fourteen establishments. Of the 32 establishments in need of pollution control measures about 25% are related to the textile industry, 19% chemical, 19% food, 12% petroleum and coal products, 12% miscellaneous, 9% paper and 4% metals. Those establishments for which needs have not been determined consist principally of chemical and petroleum industries the majority of which have waste treatment facilities in operation.

Ten of the 11 industrial establishments which propose to discharge their waste waters into the municipal sewer systems are located in Philadelphia. These consist of textile, chemical, food and primary metal industrial establishments.

TABLE I

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Industrial* Waste Pollution Abatement Needs
May 1952

Needs	Number
New Treatment Plant or Other Pollution Control Measures	17[a)]
Enlargement or Adiditions to Existing Plant	5
Replace Existing Plant	-
Connection to Municipal Sewer System	10
No Project Needed	14[b)]
Undetermined	14
TOTAL	60

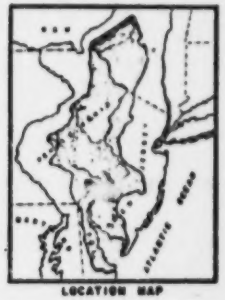
* Industries having separate outlets discharging wastes directly to watercourse.

a) Includes one establishment which is making internal process changes to reduce pollution.

b) Includes two separate sewage treatment plants and also four chemical industries which discharge untreated industrial wastes the latter having a combined pollution load with a population equivalent of 810.

Pollution abatement needs are shown on Map No. 3.

Considerable progress has been made in the program for the control of pollution from municipal sources in Zone 3 of the Delaware River Basin. The new Southeast and Southwest sewage treatment plants under construction in the City of Philadelphia, Pennsylvania, the Central Delaware County Authority project and the new Main Plant in Camden, New Jersey along with the enlargements of existing Baldwin Run Plant in Camden, New Jersey, the plant in Moorestown Twp., New Jersey and the West Chester, Pennsylvania-Goose Creek plant will serve about 1,596,000 persons or approximately 85% of the population in need of



NO POLLUTION ABATEMENT NEEDED

ABATEMENT NEEDS UNDETERMINED

EXISTING PLANT NEEDS REPLACEMENT, ENLARGEMENT, ADDITIONS OR OTHER POLLUTION CONTROL MEASURES

TREATMENT PLANT OR OTHER POLLUTION CONTROL MEASURES NEEDED

P UNDER CONSTRUCTION

NOTE-
Numbers used in symbols represent number of pollution abatement needs in the area in the category designated

Compiled from data submitted by the respective state water pollution control agencies as of May 1958

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treatment facilities.(Table J) Five municipalities are in the active planning stage for sewage treatment facilities to serve about 46,600 persons and final plans have been approved for nine municipalities which will construct ten plants to serve a population of approximately 146,700.

At present, there are four municipalities whose status is considered inactive. This does not mean that these municipalities are not being considered in the overall program. All have treatment plants in need of improvements. Westville, New Jersey will be required to meet the time schedule set for completion of the plants in the City of Camden, and Chester, Tinicum Township and Our Lady of Angels Convent, in Delaware County, Pennsylvia will be required to meet the schedule established for the Delaware County Authorities.

There are four industrial establishments which have construction of waste treatment facilities underway.(Table K)

TABLE J

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Current Status of Municipal* Action on
Pollution Abatement Needs
May 1952

Status of Action	Number of Municipalities	Population Served by Facilities
Inactive	4 (4 sources)	77,350
Active Planning**	5 (5 sources)	46,600
Final Plans Approved***	9 (11 sources) a)	146,700
Under Construction	5 (10 sources) b)	1,596,100
TOTAL	23 (30 sources)	1,866,750

* Includes incorporated or unincorporated municipalities, other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers or other large population centers.

** Includes preliminary action such as securing engineering services, making survey, preparing plans, arranging for purchase of site, developing financial program, studying means for additional treatment, or consideration of joint treatment with industry or other municipalities.

*** Includes plans approved by State Water Pollution Control Agency or Final plans submitted to said Agency for approval.

a) Includes Haddon Twp., Canden County, N.J.-Bluebird, West Collingswood and Westmont Sections.

b) Includes Camden, N.J. listed as five sources and Philadelphia, Pa. as two sources. Seven plants under construction in five municipalities will serve the ten sources .

TABLE K

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Current Status of Industrial* Action on
Pollution Abatement Needs
May 1952

Status of Action	Number of Industries
Inactive	-
Active Planning a)	18
Final Plans Approved b)	8
Under Construction	4
Undetermined	2
	32

* Industries having separate outlets discharging wastes directly to watercourse.

a) Includes preliminary action such as securing engineering services, making survey, preparing plans, arranging for purchase of site, developing financial program, studying need for additional, joint or pre-treatment, pilot plant operation, internal process changes, or negotiations with municipality to enter municipal sewer system.

b) Includes plans approved by State Water Pollution Control Agency, final plans submitted to said Agency for approval, or permission granted by municipality for connection to municipal sewer system.

The Philadelphia Gas Works is enlarging its existing treatment works to treat the gas processing wastes and the Eddystone Manufacturing Company has a new works under construction for treatment of its dye wastes. In New Jersey the Ruberoid Company in Gloucester has a new treatment works under construction and the American Cyanamid Co.(Calco) also in Gloucester has completed pilot plant studies and has treatment facilities under construction.

Active planning is underway by 18 industries for corrective measures to control stream pollution. The needs will be provided through the construction of nine new waste treatment works, additions or enlargements of two existing plants and the connection of six establishments to the municipal sewer systems with treatment at the municipal sewage treatment plants, and one plant has internal process changes underway to reduce pollution.

Final plans have been approved for disposal of the wastes from eight establishments. The Scott Paper Co., Chester, Pa., has final plans approved for additions to its existing waste treatment facilities and the Yorshire Worsted Mills, Inc., Delaware County, Pa. has submitted plans of a new treatment plant for approval. Final plans have also been approved for the Riverton Laundry East Riverton, New Jersey. Arrangements for discharging their industrial wastes into the municipal sewer systems have been completed by the Anchor Dyeing and Finishing Co., Hellwig Silk Dyeing Corporation, Pennsylvania Forge Co., and the Rohm and Haas Co. of Philadelphia, Pennsylvania and the Morgan Bros. Laundry in Haddon Twp., Camden County, New Jersey.

In addition to the intercepting sewers and municipal sewage treatment plants placed under construction or recently completed in Zone 3 industrial establishments which have completed new waste treatment works or enlarged existing treatment facilities include the Philadelphia Electric Co. - Richmond Station, Philadelphia Coke Co., Scott Paper Co., Alden Rug Mills Inc., Standard Pressed Steel Co. and Paper Products Manufacturing Company.

Much has been done to alleviate pollution in Zone 3 of the Delaware River Basin but continued activity is necessary to bring about further abatement to restore the Delaware River to the desired quality of water for the expected principal uses of navigation, industrial water supply and other purposes and such that it will not be unfit for use as sources of water supply, harmful to fish life or adversely affect the quality of the waters of the tidal tributaries, as set forth in the classification of zones as established by the Interstate Commission on the Delaware River Basin.

The development of either or both the Incodel plan for the comprehensive development of the Delaware River and the proposed Delaware channel improvement by the Corps of Engineers will directly affect conditions in Zone 3 of the Delaware River.

A list of the municipalities and industries needing improvements as of May 1952 for abatement of pollution in Zone 3 of the Delaware River Basin, exclusive of the Schuylkill River Basin, are set forth in Table L. Basic data as of May 1952 on the sources of municipal and industrial pollution entering Zone 3 are presented in Tables 1 and 2 of the Appendices.

TABLE L

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Municipalities and Industries Needing Improvements
for Abatement of Pollution*
May 1952

New Jersey

Camden
  Main Plant**
  Baldwins Run Plant**
  Fairview Section Plant

  Armstrong Cork Co.
  Kind & Knox Gelatin Co.
  Mac Andrews & Forbes, Inc.
  Public Service Gas &
    Electric Co.

Collingswood
 (East Riverton)
  Riverton Laundry

 (Gloucester)
  American Cyanamid Co.
  Calco Div.**
  The Ruberoid Co.**

Haddon Heights

Haddon Township
  Bluebird Section
  West Collingswood Section
  Westmont Section
  Morgan Bros. Laundry

Merchantville - Pennsauken

Moorestown Township**

Palmyra

Riverton

Swedesboro
  (California Packing Co.)

  (Voorhees Twp.)
    Moyer-Mitchell Co.

  (West Deptford Twp.)
    Texas Oil Co.

Westville

Woodbury Heights

* For details see Tables Nos. 1 and 2. This table does not include municipalities or industries listed with needs undetermined.

** Needed improvements are under construction.

( ) Municipalities enclosed by parenthesis are not in need of improvements and only indicate the location of the industrial establishment.

TABLE L

DELAWARE RIVER BASIN - ZONE 3
(Exclusive of the Schuylkill River Basin)

Municipalities and Industries Needing Improvements
for Abatement of Pollution*
May 1952

Pennsylvania

(Aston Twp., Delaware Co.)
Alden Rug Mills, Inc.
Our Lady of Angels Convent
Yorkshire Worsted Mills, Inc.
Aston

Central Delaware County Authority**

Chester
Scott Paper Co.

Darby Creek Joint Authority

(Eddystone)
Eddystone Mfg. Co.**

(Horsham)
Willow Ridge Farm

(Lansdowne)
Mazer Paper Co.

Lower Delaware County Sewer
Board

(Middletown Twp., Delaware Co.)
George Brown & Sons, Inc., Lenni
Glen Mills Girls School
Wa Wa Dairy Farms (Industrial Wastes)

Muckinapattus Creek Authority

Philadelphia
South East Plant**
South West Plant**
Anchor Dyeing & Finishing Co.
Barrett Division, Allied
Chemical & Dye Corp.
Delaney & Co.
Delta Co.
Frankford Arsenal
Hellwig Silk Dyeing Corp.
Pennsylvania Forge Co.
Philadelphia Gas Works**
Rohm & Haas Co.
Chas. R. Shoemaker
F. W. Tunnell & Co, Inc.
U. S. Naval Base

Radnor - Haverford

Tinicum Twp., Delaware County

Upper Moreland Twp.- Hatboro

West Chester - Goose Creek
Plant**

(West Goshen Twp., Chester Co.)
Grocery Store Prod. Co.

* For details see Tables Nos. 1 and 2. This table does not include municipalities or industries listed with needs undetermined.

** Needed improvements are under construction

( ) Municipalities enclosed by parenthesis are not in need of improvements and only indicate the location of the industrial establishment.

BASIC DATA TABLES

The data as of May 1952 listed on the following Basic Data Tables were reported by the New Jersey Department of Health and the Sanitary Water Board of the Pennsylvania Department of Health. They are arranged by watershed area which enables the reader to isolate, for any particular area, the amounts and kinds of pollution being discharged and the adequacy of treatment where provided. The principal stream is listed first, starting with the sources of pollution farthest upstream and continuing down to the mouth. Each tributary along with its branches is then covered in downstream order. Those branches which receive no pollution are not listed, while those receiving municipal pollution will be found in Table 1 (Municipal) and similarly, those receiving industrial pollution in Table 2 (Industrial).

The reader is cautioned not to assume the entries as listed to be final. Changing conditions in water uses, pollution contributed, stream quality, information obtained during surveys and other circumstances, may dictate readjustments.

Table 1. applies to municipalities. Included, but not listed, are those industries discharging wastes into municipal sewers. Table 2 applies only to industries discharging directly to a watercourse.

To aid in finding the location of the various sources of pollution, a stream code and river mileage system has been devised. Each of the pollution points on any stream is listed in downstream order beneath the name of that stream, accompanied by its distance in river miles from the mouth of the stream. Tributary streams are further identified by a symbol indicating the stream to which they are tributary and a mileage number indicating in river miles the point at which they join the larger stream. With this information any sources of pollution may be located with respect to the mouth of the main stream of the Basin.

Example: To locate the outfall of Oaklyn, New Jersey listed in Table 1. It is found that Oaklyn discharges to Peter's Creek at a point 0.5 miles from its mouth. Peter's Creek (Ne-2.0) enters Newton Creek at a point 2.0 miles from its mouth. Newton Creek (D-4d.8) flows into the Delaware River at a point 48.8 miles from its mouth at Liston Point, Delaware which has been established as the zero point for the river system covered in this report. Accordingly, Oaklyn, New Jersey is 51.3 stream miles above the mouth of the Delaware River at Liston Point.

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Stream Code

Zero Mileage-Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
DELAWARE RIVER									
Riverton, N.J.	60.2	3,700	N	None	-	-	3,700	New Plant	Final plans approved for secondary treatment.
Palmyra, N.J.	58.9	5,900	N	Primary	Unsat.	Sat.	10,000	Additions	Final plans approved.
Philadelphia, Pa. N.E. Plant	56.0	600,000E	N	Secondary	Sat.	Sat.	150,000E	None	New plant placed in operation in April, 1951.
Camden, N. J. 16 S & IW Outlets	54.0) 49.0)	120,000	230,000	None	-	-	230,000	New Plant	New Main Plant under construction to serve raw sewage outlets on Delaware River, Cooper River and Newton Creek; Interceptors and Plant scheduled for completion in 1955

* Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns; significant institutions, resorts, recreational centers or other population centers.

** Includes industrial wastes discharged into municipal sewerage systems.

E - Estimated N - Data not available

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Stream Code

Zero Mileage-Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
DELAWARE RIVER (cont.)									
Philadelphia, Pa. S.E. Plant	48.4	677,500E	N	None	-	-	677,500E ***	New Plant	Under construction; to be completed in 1953.
Gloucester, N.J.	48.0	15,600	7,000	Secondary	Sat.	Sat.	1,250	None	New Plant placed in operation 4/51. Present loading 50% capacity.
Philadelphia, Pa. S. W. Plant	43.2	731,000E	N	None	-	-	731,000E ***	New Plant	Under construction; to be completed in 1953.
Central Delaware County Authority, Pa.	36.5	47,300E	N	None	-	-	47,300E ***	New Plant	Under construction; Primary treatment project to serve 8 communities-Morton, Prospect Park, Ridley Park, Rutledge and Swarthmore Boroughs and Nether Providence Ridley and Springfield townships.

***These figures do not include the population equivalents of industrial wastes discharged to the sewerage systems.

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Stream Code

D - Delaware River
Pe- Pennypack Creek (D-61.6)

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to Watercourse **	Treatment Needs	Remarks Current Status
DELAWARE RIVER (cont.)									
Chester, Pa.	33.0	70,000E	N	Primary	Unsat.	Sat.	42,000E ***	Enlargement	Inactive
Lower Delaware County Sewer Board, Pa.	32.0	12,000E	N	None	-	-	N	New Plant	Final plans submitted for primary treatment project to serve Marcus Hook Borough, Lower Chichester Twp., & Upper Chichester Twp.
PENNYPACK CREEK D-61.6									
U.S. Naval Air Station, Horsham Twp., Montgomery Co., Pa.	16.0	N	N	Secondary	Sat.	Sat.	N	None	
Upper Moreland Twp. Hatboro, Pa.	14.0	7,000E	N	Secondary	Unsat.	Undet.	1,200E	Additions	Abatement ordered; Final plans under preparation.
Bryn Athyn Academy Bryn Athyn, Pa.	12.0	350E	N	Secondary	Sat.	Sat.	50E	None	

***These figures do not include the population equivalents of industrial wastes discharged to the sewerage systems.

Stream Code
D - Delaware River
P - Pennsauken Creek (D-57.4)
B - Baldwins Run (D-54.7)
Co-Cooper River (D-53.4)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
NORTH BRANCH PENNSAUKEN CREEK P-4.0									
Moorestown Twp., N.J.	5.0	8,800	17,300	Secondary	Sat.	Sat.	2,900	Additions	Under construction to serve future development.
Mapleshade Twp., N.J.	1.5	5,800	5,800	Secondary	Sat.	Sat.	1,500	None	
SOUTH BRANCH PENNSAUKEN CREEK P-4.0									
Delaware Twp., N.J. Colwick Section	3.5	1,000E	N	Secondary	Sat.	Sat.	300	None	
BALDWINS RUN D-54.7									
Camden, N.J. Baldwins Run Plant	0.5	3,500	N	Primary	Unsat.	Sat.	12,500	Additions and Enlargements	Modified activated sludge unit under construction is practically completed; Awaiting pumping equipment.
COOPER RIVER D-53.4									
Somerdale, N.J.	11.0	1,400	1,800	Secondary	Sat.	Sat.	50	None	

Stream Code

D - Delaware River
Co - Cooper River (D-53.4)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
COOPER RIVER (cont.)D-53.4									
Haddonfield,N.J.	8.0	11,100	27,600	Secondary	Sat.	Sat.	4,200	None	Enlarged 4/51
Delaware Twp.,N.J. Erltcn Section	7.0	3,000	2,900	Secondary	Sat.	Sat.	800	None	Enlarged 4/51
Garden State Racing Assoc.,Delaware Twp., N.J.	6.0	5,000	2,900	Secondary	Sat.	Unsat.	700	None	
Haddon Twp.,N.J. Westmont Section	5.8	1,700	2,100	Secondary	Unsat.	Sat.	500	Replacement	Final plans approved; Includes pumping station and force main to serve the Bluebird Section
Haddon Twp.,N.J. Bluebird Section	5.0	3,000E	N	Primary	Unsat.	Unsat.	4,100	Additions	Plant to be abandoned Area to be served by the Westmont Section plant for which final plans are approved
Merchantville-Pennsauken, N.J.	4.6	26,000E	20,800	Primary	Unsat.	Sat.	12,800	Additions	Final plans approved

Stream Code

D - Delaware River
Co - Cooper River (D-53.4)
Ne - Newton Creek (D-48.8)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
Camden, N.J. 11 raw sewage outlets	0.0 2.0	-	146,000	None	-	-	146,000	New Plant	To be served by the New Main Plant which is under construction
NEWTON CREEK D-48.8									
Haddon Twp.,N.J. Cuthbert Road Section	5.0	4,600	5,300	Secondary	Sat.	Sat.	800	None	
Haddon Twp.,N.J. Bettlewood Section	4.2	1,000E	1,100	Secondary	Sat.	Sat.	500	None	
Collingswood, N.J.	3.5	23,000	50,600	Secondary	Unsat.	Sat.	17,600	Enlargement	Active planning
Haddon Twp.,N.J. W. Collingswood Sect.	2.5	800 E	N	Secondary	Unsat.	Sat.	200	Enlargement	Final plans app'd.
Camden, N.J. 1 raw sewage outlet	0.5	-	19,400	None	-	-	19,400	New Plant	To be served by the New Main Plant which is under construction
Camden, N.J. Fairview Section	0.5	2,000	N	Primary	Unsat.	Sat.	9,200	Replacement	To be abandoned; Area to be served by the New Main Plant

Stream Code

D - Delaware River
Ne - Newton Creek (D-48.8)
Ns - South Branch Newton Creek (Ne-0.9)
B - Big Timber Creek (D-47.2)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
PETER'S CREEK Ne-2.0									
Oaklyn, N.J.	0.5	4,900	13,400	Secondary	Sat.	Sat.	600	None	
NORTH BRANCH NEWTON CREEK Ne-0.9									
Woodlynne, N.J.	1.8	3,200	N	Primary	Sat.	Sat.	900	None	
SOUTH BRANCH NEWTON CREEK Ne-0.9									
Audubon, N.J.	2.4	10,000	14,100	Secondary	Sat.	Sat.	3,300	None	
KINGS RUN Ns-2.6									
Haddon Heights, N.J.	1.2	6,200	9.800	Secondary	Unsat.	Sat.	4,900	Enlargement	Final plans approved
BIG TIMBER CREEK D-47.2									
Bellmawr, N.J. FHA Housing	2.8	1,400	N	Primary	Unsat.	Unsat.	1,500	Undet.	
Westville, N.J.	0.6	4,500	N	Primary	Unsat.	Sat.	4,700	Enlargement	Inactive

Stream Code

D - Delaware River
B - Big Timber Creek (D-47.2)
W - Woodbury Creek (D-43.2)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
SOUTH BRANCH BIG TIMBER CREEK B-7.3									
Grenloch, N.J. Camden County Instit.	3.5	2,000	N	Secondary	Sat.	Sat.	100	None	
Gloucester Twp., N.J. Blackwood	2.0	400	N	Secondary	Sat.	Sat.	100	None	
BEAVER BROOK B-3.5									
Barrington, N.J.	3.0	1,500	1,500	Secondary	Sat.	Sat.	400	None	
LITTLE TIMBER CREEK B-0.4									
Mount Ephraim, N.J.	2.4	4,500	N	Secondary	Sat.	Sat.	1,000	None	
WOODBURY CREEK D-43.2									
Woodbury Heights, N.J.	5.0	700	800	Secondary	Unsat.	Unsat.	200	Additions	Active planning; preparing program
Woodbury, N.J.	3.0	11,000	N	Primary	Sat.	Sat.	8,200	None	

Stream Code

D- Delaware River
M - Mantua Creek (D-41.7)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
MANTUA CREEK D-41.7									
Pitman, N.J. Plant #2	14.2	2,000	N	Secondary	Sat.	Sat.	1,000	None	
Wenonah, N.J. Princeton Ave.Plant	10.5	1,500	N	Secondary	Sat.	Sat.	N	None	
Wenonah, N.J. Mantua Ave.Plant	10.5		N	Secondary	Sat.	Sat.	N	None	
Mantua Improvement Assoc., Gloucester County, N.J.	9.4	400	N	Secondary	Sat.	Unsat.	300	None	
Paulsboro, N.J.	2.5	7,800	N	Primary	Sat.	Sat.	10,900	None	
CHESTNUT BRANCH OF MANTUA CREEK M-9.8									
Glassboro, N.J.	7.0	4,500	N	Secondary	Sat.	Sat.	300	None	
Pitman, N.J. Plant #1	4.5	3,000	N	Secondary	Sat.	Sat.	800	None	

Stream Code

D - Delaware River
Da - Darby Creek (D-37.0)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Adequacy Treatment Facilities Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
DARBY CREEK D-37.0									
Radnor-Haverford,Pa.	16.5	13,500E	N	Secondary	Unsat.	Undet.	2,000E	Enlargement	Abatement ordered; Final plans under preparation.
Darby Creek Joint Authority, Pa.	5.0	70,000E	N	None	-	-	70,000E ***	New Plant	Final plans approved for complete treatment to serve 13 communities-Aldan,Clifton Hgts. Collingdale,Colwyn, Darby,Folcroft,Lansdowne,Sharon Hill, Springfield & Yeadon Bors.&Darby, Haverford & Upper Darby twps.;Construction ordered; Project to soon be advertised for bids
Tinicum Township Delaware County,Pa.	3.0	2,600E	N	Primary	Unsat.	Sat.	1,900E	Additions	Inactive

***These figures do not include the population equivalents of industrial wastes discharged to the sewerage systems.

TABLE I

Stream Code

D - Delaware River

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
MUCKINAPATTUS CREEK Da-2.5									
Muckinapattus Creek Authority, Pa.	0.1	16,800E	N	None	-	-	16,800E ***	New Plant	Final plans appr'd. for complete treatment project to serve 9 communities-Clifton Hgts., Folcroft, Glenolden, Morton & Norwood Bors. and Darby, Ridley, Springfield and Upper Darby twps; Construction ordered; Project is ready for advertising for bids.
CRUM CREEK D-36.7									
Rush Hospital, Chester Co., Pa.	17.0	100E	N	Secondary	Sat.	Sat.	10E	None	
Ellis College, Delaware Co., Pa.	13.9	150E	N	Secondary	Sat.	Sat.	30E	None	

***These figures do not include the population equivalents of industrial wastes discharged to the sewerage systems

Stream Code

D - Delaware River
R - Ridley Creek (D-35.4)
C - Chester Creek (D-34.4)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
RIDLEY CREEK D-35.4									
Elwyn Training School Delaware County, Pa.	6.7	1,200E	N	Secondary	Undet.	Undet.	N	Undet.	
Media, Pa.	6.5	5,700E	N	Secondary	Sat.	Sat.	800E	None	
Rose Valley, Pa.	5.6	400E	N	Secondary	Sat.	Sat.	100E	None	
Eddystone, Pa.	0.3	3,000E	N	Primary	Sat.	Sat.	2,000E	None	
CHESTER CREEK D-34.4									
Cheyney State Teachers College, Thornbury Twp., Delaware County, Pa.	14.4	500E	N	Secondary	Sat.	Sat.	80E	None	Enlargement recently completed
Glen Mills Boys School (Glen Mills) Thornbury Twp., Dela. Co., Pa.	11.9	700E	N	Secondary	Sat.	Sat.	100E	None	
Glen Mills Girls School Middletown Twp., Delaware County, Pa.	11.8	600E	N	Secondary	Unsat.	Sat.	180E	Additions	Plans submitted

Stream Code

D - Delaware River
C - Chester Creek (D-34.4)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
CHESTER CREEK (cont.) D-34.4									
Delaware County Prison Farm, Concord Twp., Delaware Co., Pa.	11.2	400E	N	Secondary	Sat.	Sat.	100	None	
Our Lady of Angels Convent, Aston Twp., Delaware Co., Pa.	8.9	250E	N	Secondary	Unsat.	Sat.	100E	Enlargement	Inactive
GOOSE CREEK C-15.3									
West Chester, Pa. Goose Creek Plant	2.5	6,000E	N	Secondary	Unsat.	Unsat.	1,800E	Enlargement	Under construction
Pennsylvania Epileptic Hospital and Farm, Westtown, Pa.	0.6	200E	N	Secondary	Sat.	Sat.	40E	None	
ROCKY RUN C-9.4									
Delaware County Home, Pa.	1.0	600E	N	Secondary	Sat.	Sat.	80E	None	

Stream Code

D- Delaware River
C- Chester Creek (D-34.4)

TABLE I

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Municipal* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E. (B.O.D.) Untr't. Wastes	Waste Treatment Provided	Adequacy Treatment Facilities Cap'y.	Opr.	P.E. (B.O.D.) Discharged to ** Watercourse	Treatment Needs	Remarks Current Status
CHROME RUN C-6.5									
Williamson School, Middletown Twp., Delaware County, Pa.	1.4	250E	N	Secondary	Sat.	Sat.	50E	None	
RACCOON CREEK D-32.7									
Swedesboro, N.J.	8.3	2,400	3,200E	None	-	-	3,200E	New Plant	Active planning; considering joint treatment with California Packing Company.

Stream Code

Zero Mileage - Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Adequacy Opr.			
DELAWARE RIVER									
Pennsylvania Forge Co. Philadelphia, Pa.	60.2	Primary Metals	Organic	None	-	-	N	Connec.to Municipal Sewer System	Have permission to enter municipal sewer system;Oily wastes
Delaney & Co., Philadelphia,Pa.	60.0	Chemical	Organic	Primary	Unsat.	Unsat.	N	Connec. to Municipal Sewer System	Negotiating to discharge pretreated industrial wastes to municipal sewer system; Glue mfg.wastes
Henry Disston & Sons, Inc., Philadelphia,Pa.	59.0	Fab. Metals	Inorg.	Intermediate	Undet.	Undet.	N	Undet.	Part of wastes discharged into municipal sewer system; other part may need additional treatment.

* Industries having separate outlets and discharging wastes directly to watercourse.

E - Estimated N - Data not available

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Stream Code

Zero Mileage - Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

Name and Location	Mouth	Type of Industry	Produced	Treatment or Other Pollution Control Measures	Adequacy		P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Cap'y.	Opr.			
DELAWARE RIVER (cont.)									
Hellwig Silk Dyeing Corp., Phila., Pa.	58.3	Textile	Organic & Inorg.	None	-	-	N	Conn. to Municipal Sewer Sys.	Have permission to enter municipal sewer system; Dye wastes
Philadelphia Coke Co., Phila., Pa.	57.0	Petro. & Coal	Organic	Intermediate	Undet.	Undet.	N	Undet.	Sewage and part of industrial wastes discharged to municipal sewer system; Treatment works recently completed for balance of industrial wastes
Kieckhefer Container Corp., Pennsauken Twp., N.J.	56.0	Paper	Organic	Primary	Sat.	Sat.	21,000E	None	
Philadelphia Gas Works, Phila., Pa.	55.4	Petro. & Coal	Organic	Secondary	Unsat.	Unsat.	N	Enlargement	Under construction Gas processing wastes

Stream Code

Zero Mileage - Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Adequacy Opr.			
DELAWARE RIVER (cont.)									
Kind & Knox Gelatin Co., Camden, N.J.	53.0	Chemical	Organic	None	-	-	31,500	New Plant	Cooling waters and process waste waters; Engineer engaged studying problem of treatment or connection to municipal sewer system.
Public Service Gas & Electric Co., Camden, N.J.	50.6	Petro. & Coal	Organic	None	-	-	58,600	New Plant	Gas plant is shut down; Wastes from coke plant; Engineer engaged
Armstrong Cork Co. Camden, N.J.	48.7	Textiles	Organic	None	-	-	44,700	New Plant	Engineer engaged

TABLE 2

Stream Code

D - Delaware River
Pe - Pennypack Creek(D-61.6)

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Adequacy Opr.			
TRIBUTARY TO PENNYPACK CREEK Pe-12.5									
Sun Oil Co., (Bulk Station) Willow Grove, Pa.	0.7	Petro. & Coal	Organic	Primary	Sat.	Sat.	N	None	
VALLEY CREEK Pe-11.0									
Philadelphia Transportation Co., Abington, Pa.	1.0	Miscellaneous	Organic	Secondary	Sat.	Sat.	N	None	
WOODEN BRIDGE RUN Pe-3.0									
E. G. Budd Mfg. Co. Philadelphia, Pa.	2.0	Fabr. Metals	Organic (Sewage & some I.W.)	Secondary	Sat.	Sat.	N	None	
E. G. Budd Mfg. Co. Philadelphia, Pa.	2.0	Fabr. Metals	Inorg.	Secondary	Sat.	Sat.	N	None	

Stream Code

Zero Mileage - Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Adequacy Opr.			
DELAWARE RIVER (cont.)									
The Ruberoid Co., Gloucester, N.J.	47.6	Petro. & Coal	Organic	None	-	-	39,000	New Plant	Under construction
Harshaw Chemical Co.,Gloucester,N.J.	47.5	Chemical	Organic	None	-	-	300	None	
American Cyanamid Co., (Calco),Gloucester,N.J.	47.4	Chemical	Organic	None	-	-	10,900	New Plant	Pilot plant studies completed. Under construction
Texas Oil Co.,West Deptford Twp.,N.J.	45.8	Petro.& Coal	Organic	Primary	Sat.	Undet.	15,600	Additions	Active planning, studying additional treatment processes
U.S. Naval Base Philadelphia, Pa.	45.0	Miscellaneous	Organic & Inorg.	None	-	-	N (Industrial waste problem under study)	New Plant (Indus.)	Constructed sanitary sewer system with discharge into Philadelphia mun. sewer sys.

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial*Pollution

May, 1952

Stream Code

Zero Mileage - Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
DELAWARE RIVER (cont.)									
Socony Vacuum Co. Paulsboro, N.J.	39.0	Petro. & Coal	Organic	Primary	Sat.	Sat.	51,800	None	
E.I. duPont de Nemours & Co., Greenwich Twp.,N.J.	37.2	Chemical	Inorg.	Primary	Undet.	Undet.	N	Undet.	Acid wastes
Pennsylvania Industrial Chemical Corp., Chester, Pa.	35.0	Chemical	Organic	Primary	Sat.	Sat.	N	None	
Scott Paper Co. Chester, Pa.	34.8	Paper	Organic	Secondary	Unsat.	Sat.	N	Additions	Waco filters in operation at present; $700,000 cost of recently completed facilities Final plans approved for additional treatment work; Construction ordered.

Stream Code

Zero Mileage - Liston Point, Del. Hope Creek, N.J. dividing line between Delaware River and Delaware Bay, 49.97 miles above Cape Henlopen Light
Pe - Pennypack Creek (D-61.6)

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
DELAWARE RIVER (cont.)									
Philadelphia Electric Co., Chester, Pa.	32.9	Petro. & Coal	Organic	Primary	Undet.	Undet.	N	Undet.	-
Sinclair Refining Co., Trainer, Pa.	31.0	Petro. & Coal	Organic	Primary	Undet.	Undet.	N	Undet.	-
PENNYPACK CREEK D-61.6									
Willow Ridge Farm Horsham, Pa.	14.7	Food	Organic	None	-	-	N	New Plant	Abatement ordered**; Action undetermined; Milk processing wastes.
American Metal Specialty Co., Hatboro, Pa.	13.7	Fabr. Metals	Organic	None	-	-	N	Undet.	-

* Industries having separate outlets and discharging wastes directly to watercourse
**Abatement order issued by the Pennsylvania Sanitary Water Board
N - Data not available

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Stream Code

D - Delaware River
F - Frankford Creek (D-58.7)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
POMPESTON CREEK D-61.3									
Riverton Laundry East Riverton, N.J.	0.5	Miscellaneous	Organic	None	-	-	300	New Plant	Final plans approved
FRANKFORD CREEK D-58.7									
Anchor Dyeing & Finishing Co., Philadelphia, Pa.	2.9	Textile	Organic	None	-	-	N	Connec. to Municipal Sewer System	Have permission enter municipal sewer system; Dye wastes
Delta Co., Philadelphia, Pa.	1.7	Textile	Organic	None	-	-	N	Connec.to Municipal Sewer System	Negotiating to enter Municipal sewer system; Dye wastes
F.W. Tunnell & Co., Inc.,Phila.,Pa.	1.6	Chemical	Organic	None	-	-	N	Connec.to Municipal Sewer System	Negotiation to enter municipal sewer system; Glue and fertilizer mfg. wastes

Stream Code

D - Delaware River
F - Frankford Creek (D-58.7)

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Adequacy Opr.			
FRANKFORD CREEK (cont.) D-58.7									
Chas. R. Shoemaker, Philadelphia, Pa.	1.4	Food	Organic	None	-	-	N	Connec.to Municipal Sewer System	Negotiating to enter Municipal sewer system; Abattoir wastes.
Barrett Division, Allied Chemical & Dye Corp., Phila., Pa.	1.0	Chemical	Organic	None	-	-	N	New Plant	Abatement ordered**.Making internal process changes to reduce pollution
Frankford Arsenal, Philadelphia, Pa.	0.2	Miscellaneous	Organic	None	-	-	N	Connec.to Municipal Sewer System	Abatement ordered**; Active planning
Rohm & Haas Co. (Chas.Lennig Co.) Philadelphia, Pa.	0.2	Chemical	Organic	Primary	Undet.	Undet.	N	Connec.to Municipal Sewer System	Have permission discharge pretreated wastes into the Municipal Sewer System

**Abatement order issued by the Pennsylvania Sanitary Water Board

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Stream Code

D - Delaware River
F - Frankford Creek (D-58.7)
T - Tacony Creek(F-5.0)
Co - Cooper River (D-53.4)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
TACONY CREEK F-5.0									
Gulf Oil Corp., Abington, Pa.	9.0	Petro. & Coal	Organic	Primary	Sat.	Sat.	N	None	
Standard Pressed Steel Co., Abington Twp., Montgomery Co., Pa.	7.0	Fabr. Metals	Organic	Secondary	Undet.	Undet.	N	Undet.	Treatment works recently completed and in operation. Additional industrial plant expansion is underway. Domestic sewage will be discharged to municipal plant.
COOPER RIVER D-53.4									
Morgan Bros. Laundry Haddon Twp., N.J.	8.2	Miscellaneous	Organic	None	-	-	1,400	Conn.to Municipal Sewer System	Have permission connect to municipal sewer system for treatment at Westmont Sect. Plant

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Stream Code

D - Delaware River
Co - Cooper River (D-53.4)
M - Mantua Creek (D-41.7)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
COOPER RIVER (cont.) D-53.4									
Taylor, White Extracting Co., Camden, N.J.	1.6	Chemical	Organic	None	-	-	100	None	
Monsanto Chemical Co., Camden, N.J.	1.4	Chemical	Organic	None	-	-	50	None	
General Chemical Co., Camden, N.J.	1.2	Chemical	Organic	None	-	-	400	None	
SOUTH BRANCH COOPER RIVER Co-8.5									
Moyer-Mitchell Co., Voorhees Twp., N.J.	2.1	Food	Organic	None	-	-	600	New Plant	Active planning. Process waste waters containing chicken blood
MANTUA CREEK D-41.7									
E.I. duPont de Nemours & Co. Paulsboro, N.J.	1.0	Chemical	Inorganic	None	-	-	N	Undet.	Acid wastes

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Stream Code

D - Delaware River
M - Mantua Creek (D-41.7)
Da- Darby Creek (D-37.0)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
MANTUA CREEK (cont.)	D-41.7								
I. P. Thomas Co., Paulsboro, N.J.	0.2	Chemical	Organic	None	-	-	N	Undet.	Wastes from mfg. of fertilizer
DARBY CREEK	D-37.0								
V. Di Francesco & Sons, Springfield Twp., Delaware Co., Pa.	11.8	Other Mining	Inorganic	Inter-mediate	Sat.	Sat.	N	None	
Bates Chemical Co., Lansdowne, Pa.	8.7	Chemical	Organic	None	-	-	N	Undet.	-
Mazer Paper Co., (Hudson Paper & Pulp Co.), Lansdowne, Pa.	8.1	Paper	Organic	Inter-mediate	Unsat.	Sat.	N	Additions	Abatement ordered;** Negotiating to enter Darby Creek Authority sewer system.
Gulf Oil Tank Farm, Darby, Pa.	7.6	Petro.& Coal	Organic	Primary	Undet.	Undet.	N	Undet.	

** Abatement order issued by Pennsylvania Sanitary Water Board

Stream Code

D- Delaware River
Cr- Crum Creek (D-36.7)
R - Ridley Creek (D-35.4)
C - Chester Creek (D-34.4)

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Capty.	Adequacy Opr.			
CRUM CREEK 36.7									
Paper Products Mfg. Co., Nether Providence Twp., Dela. Co., Pa.	4.9	Paper	Organic	Inter-mediate	Undet.	Undet.	N	Undet.	Treatment works recently constructed
RIDLEY CREEK D-35.4									
Eddystone Mfg.Co., Eddystone, Pa.	0.1	Textile	Organic & Inorg.	None	-	-	N	New Plant	Under construction; Dye wastes
CHESTER CREEK D-34.4									
Wa Wa Dairy Farms, (Wa Wa), Middletown Twp., Delaware Co., Pa.	9.3	Food	Sanitary Sewage	Secondary	Sat.	Sat.	10	None	Consultant engaged; Satisfactory treatment plant in operation for sanitary sewage only
	9.3	Food	Organic	None	-	-	N	New Plant	
George Brown & Sons Inc.,(Lenni),Middletown Twp.,Delaware Co.,Pa.	8.3	Textiles	Organic & Inorg.	None	-	-	N	New Plant	Abatement ordered;** Undetermined action: Dye wastes

**Abatement order issued by Pennsylvania Sanitary Water Board

Stream Code

D - Delaware River
C - Chester Creek (D-34.4)

TABLE 2

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial* Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (P.O.D) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'ty.	Adequacy Opr.			
CHESTER CREEK(cont.)D-34.4									
Yorkshire Worsted Mills, Inc.,(Aston) Aston Twp.,Dela. Co., Pa.	8.3	Textiles	Organic	None	-	-	N	New Plant	Plans submitted; Dye wastes
Alden Rug Mills,Inc. (Aston), Aston Twp., Delaware Co., Pa.	8.0	Textiles	Organic & Inorg.	Inter-mediate	Unsat.	Sat.	N	Additions	Formerly Jefferies Dyeing Works: Recently completed facilities cost $15,000: Studying additional treatment needs; Dye wastes.
GOOSE CREEK C-15.3									
Grocery Store Prod. Co.,West Goshen Twp.,Chester Co.,Pa.	6.0	Food	Organic	None	-	-	N	New Plant	Abatement ordered;**Consultant engaged; Mushroom canning wastes

**Abatement order issued by Pennsylvania Sanitary Water Board.

TABLE 2

Stream Code

D - Delaware River

DELAWARE RIVER BASIN - ZONE 3

(Exclusive of the Schuylkill River Basin)

Basic Data on Sources of Industrial** Pollution

May, 1952

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Treatment or Other Pollution Control Measures			P.E. (B.O.D.) Discharged to Watercourse	Pollution Abatement Needs	Remarks Current Status
				Degree	Adequacy Cap'y.	Opr.			
RACCOON CREEK D-32.7									
California Packing Co.,Swedesboro,N.J.	8.3	Food	Organic	None	-	-	70,200	New Plant	Formerly E.F. Hurff Co.,Engineer engaged; Considering joint treatment with municipality; Seasonal operation of tomato cannery
MARCUS HOOK CREEK D-30.8									
American Viscose Corp.,Marcus Hook, Pa.	0.5	Chemical	Organic	Primary	Undet.	Undet.	N	Undet.	-
Sun Oil Co., Marcus Hook, Pa.	0.1	Petro. & Coal	Organic	Primary	Undet.	Undet.	N	Undet.	-

** Abatement order issued by Pennsylvania Sanitary Water Board

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Municipality	Str.	Well	Sp.	Owner	Pop. 1940	Est. Pop. Served 1949	Av. Plant Output G.P.D. 1949	Filt.	Chlor.	None	Remarks
New Jersey											
Berlin[a]		x		M	1,753	3,500	258,000			x	
Bridgeport		x		P	630	500	35,000			x	
Brooklawn[b]		x		M	1,919	2,030	175,000		x		
Camden		x		M	117,536	95,000	23,900,000			x	
Clementon[c]		x		M	2,866	5,200	297,000			x	
Collingswood[d]		x		M	12,685	25,000	2,660,000			x	
E. Greenwich Twp., Gloucester Co.		x		M	2,121	2,000	200,000*			x	
Glassboro		x		M	4,925	5,000	350,000		x		
Gloucester		x		M	13,692	13,000	1,650,000	x	x		

*Estimated

a) Also serves Berlin Twp.
b) Also serves Bellmawr (part)
c) Also serves Lindenwold (part), and Pine Hill (part)
d) Also serves Haddon Twp. (part), and Wood Lynne

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Municipality	Str.	Well	Spr.	Owner	Pop. 1940	Est. Pop. Served 1949	Av. Plant Output G.P.D. 1949	Filt.	Chlor.	None	Remarks
New Jersey (cont.)											
Gloucester Twp., Camden Co.-											
Blackwood Sect.		x		P	6,198)	2,000	75,000		x		
Greenlock Sect.[e]		x		P	)	300	40,000		x		
Greenwich Twp. Gloucester Co.		x		M	2,563)	1,280	130,000			x	
Gibbstown Sect.		x		P	)	1,200	120,000*		x		
Haddonfield		x		M	9,742	9,000	800,000	x			
Haddon Heights[f]		x		P	5,555	56,700	4,150,000		x		Some filtered
Laurel Springs[g]		x		P	1,344	9,150	900,000*		x		
Magnolia		x		P	1,552	2,250	220,000*		x		

*Estimated

e) Also serves Washington Twp.

f) Also serves Audubon, Barrington, Bellmawr (part), Camden (part), Delaware Twp.(part), Haddonfield (part), Haddon Twp. (part), West Ephraim, Oaklyn, Pennsauken Twp. (part), Runnemede, Voorhees Twp. - Ashland Terrace Section.

g) Also serves Gibbsboro, Hi Nella, Lawnside, Lindenwold (part), Somerdale, Stratford, Voorhees Twp., Kirkwood Section.

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Municipality	Str.	Well	Spr.	Owner	Pop. 1940	Est. Pop. Served 1949	Av. Plant Output G.P.D. 1949	Filt.	Chlor.	None	Remarks
New Jersey (cont.)											
Mantua Twp., Gloucester Co.		x		P	2,433)	1,500	150,000*		x		
Sewell Section		x		P	)	400	40.000*		x		
Maple Shade Twp., Burlington Co.		x		M	5,535	5,535	200,000	x	x		
Marlton		x		P	511	700	25,000		x		
Merchantville h)		x		M	3,769	6,000	1,026,000	x	x		26,000 gpd untreated
Moorestown Twp., Burlington Co.		x		M	5,364	7,500	499,000	x	x		
Mullica Hill		x	-	P	680	600	56,000		x		
National Park i)		x		M	1,977	1,920	190,000*			x	
Palmyra j)		x		P	5,178	12,000	470,000		x		
Paulsboro		x		M	7,011	8,000	600,000			x	
Pine Hill		x		P	1,537	-	8,000			x	Also served by Clementon

h) Also serves Camden (part), Delaware Twp.(part), Pennsauken Twp.(part)
i) Also serves West Deptford Twp. - Red Bank Section
j) Also serves Cinnaminson Twp., and Riverton
* Estimated

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Municipality	Str.	Well	Sp.	Owner	Pop. 1940	Est.Pop. Served 1949	Av. Plant Output G.P.D. 1949	Filt.	Chlor.	None	Remarks
New Jersey (cont.)											
Pitman		x		M	5,507	4,000	220,000		x		
Swedesboro		x		M	2,268	2,000	100,000			x	
Wenonah		x		M	1,311	2,100	127,000			x	
W. Deptford Twp., Gloucester Co. Colonial Manor Sect.		x		P	4,336)	850	27,000		x		
Mantua Terrace Sect.		x		P	)	670	70,000*			x	
Westville k)		x		M	3,585	7,100	700,000*		x		
Woodbury l)		x		M	8,306	9,000	620,000		x		
Pennsylvania											
Chester m)	x			M	59,285	100,000	10,300,000	x	x		Delaware R. (Octoraro Creek Supply system placed in operation 11/22/51

* Estimated

k) Also serves West Deptford Twp.(part)

l) Also serves Thorofare and Woodbury Heights

m) Also serves Aston Twp., Chester Twp., Linwood, Marcus Hook, Nether Providence Twp.,(part) Parkside, Trainer, Upland, and Upper Chichester Twp.

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Municipality	Str.	Well	Sp.	Owner	Pop. 1940	Est. Pop. Served 1949	Av. Plant Output G.P.D. 1949	Filt.	Chlor.	None	Remarks
Pennsylvania (cont.)											
Delaware County Home		x	x	M	(260)	330	35,000		x		
Delaware County Prison Farm		x		M	(270)	350	55,000		x		
Ellis College			x	P	(150)	150	15,000			x	
Elwyn Training		x		P	(1250)	1250	80,000			x	
Glen Mills Boys School	x		x	M	(750)	750	100,000	x	x		
Glen Mills Girls		x		M	(560)	560	70,000		x		
Hatboro		x		M	2,605	3,600	350,000		x		
Malvern		x	x	M	1,680	1,680	300,000		x		
Media n)	x			M	5,351	12,000	2,000,000	x	x		Ridley Creek
Our Lady of Angels Convent		x		P	(250)	250-260	50,000		x		

n) Also serves Chester (part), Nether Providence Twp. (part), Rose Valley, Upper Providence Twp., and Wallingford

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Municipality	Str.	Well	Sp.	Owner	Pop. 1940	Est. Pop. Served 1949	Av. Plant Output G.P.D. 1949	Filt.	Chlor.	None	Remarks
Pennsylvania (cont.)											
Pennsylvania Epileptic Hospital & Farm		x		M	(137)	140	13,000			x	
Philadelphia	x			M	1,931,334	2,041,000	339,900,000	x	x		Delaware R. 175.3 MGD Schuylkill R.164.6 MGD
Philadelphia Suburban Water Co. o)	x			P	-	300,000	25,300,000	x	x		Crum Creek 10.2 MGD Pennypack Cr. 0.5 MGD Neshaminy Cr. 5.6 MGD Pickering Cr. 9.0 MGD
Rush Hospital		x		P	(100)	100	8,000			x	
West Chester	x			M	13,289	13,300	1,400,000	x	x		Chester Cr.
Williamson School		x		P	(250)	250	40,000		x		

o) Serves 25 boroughs and 23 townships including 35 unincorporated communities in Bucks, Chester, Delaware, and Montgomery Counties in an area west of and adjacent to the entire westerly boundary of the City of Philadelphia.

Appendix A

DELAWARE RIVER BASIN - ZONE 3

Public Water Supply Data

Owner - Treatment	Source of Supply: Stream	Well	Spring	Number of Water Systems	Estimated Population Served - 1949	Average Plant Output G.P.D. 1949
NEW JERSEY						
Municipal						
Filtration	-	5	-	5	41,035	4,175,000
Chlorination	-	5	-	5	27,130	2,065,000
None	-	10	-	10	146.000	28,462,000
	-	20	-	20	214,165	34,702,000
Private						
Filtration	-	-	-	-	-	-
Chlorination	-	12	-	12	87,650	6,273,000
None	-	3	-	3	1,170	113,000
	-	15	-	15	88,820	6,386,000
PENNSYLVANIA						
Municipal						
Filtration	5	-	1	5	2,167,050	353,700,000
Chlorination	-	5	2	5	6,520	810,000
None	-	1	-	1	140	13,000
	5	6	3	11	2,173,710	354,523,000
Private						
Filtration	1	-	-	1	300,000	25,300,000
Chlorination	-	2	-	2	500	90,000
None	-	2	1	3	1,500	103,000
	1	4	1	6	302,000	25,493,000
TOTAL:	6	45	4	52	2,778,695	421,104,000